香港中文大學
The Chinese University of Hong Kong

elt
英語教學單位
English Language Teaching Unit

# The Chinese University of Hong Kong
# English Language Teaching Unit

## ELTU2014 English for Engineering Students I

## Course booklet
## 2025–2026

# Table of Contents

# MODULE 1
# TECHNICAL COMMUNCIATION

*The learning objective of this module is to help students understand the basics of technical communication and form project teams.*

# MODULE 1A
# INTRODUCTION TO TECHNICAL COMMUNICATION

## Learning objectives

- Discuss, apply and reflect on problem-solving and thinking skills needed to be an engineer
- Understand the basic features of technical communication

## References

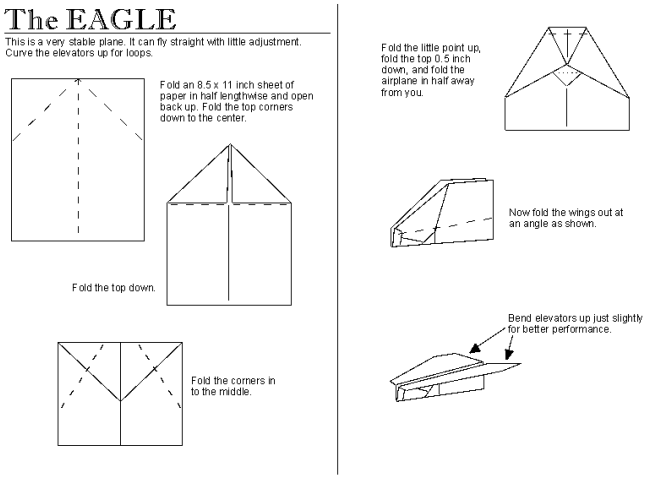

Hicks, M. J. (2004). *Problem solving and decision making: Hard, soft and creative approaches* (2nd ed.). Thomson.

Lumsdaine, E., & Lumsdaine, M. (1995). *Creative problem solving: Thinking skills for a changing world*. McGraw-Hill.

Riordan, D. G. (2005). *Technical report writing today* (9th ed.). Houghton-Mifflin.


### WARM-UP ACTIVITY: PAPER PLANE CONTEST - APPLYING YOUR CREATIVE THINKING SKILLS

In a group, design and make a paper plane that can stay aloft for the longest time possible. According to Wikipedia, the world record is held by Takuo Toda, whose paper plane stayed aloft for 27.9 seconds. See if your team can beat him!




***Rules:***

1. Time allowed: 12 minutes
2. Each team can only make the paper plane with the following optional materials provided:
   - 4 sheets of A4 paper
   - one standard paper clip

- 3 inches of tape
- a glue stick
- 3 staples

3. Each team will be given 3 to 5 minutes to introduce their design to the class (time for you to show off your knowledge of physics and aerodynamics!), after which they will demonstrate their attempt.
4. Your teacher will time the flights. Each team can have up to three chances to get their longest 'time in air'. The team whose paper plane stays in the air for the longest duration wins the game.

Adapted from: http://www.scholastic.com/teachers/collection/hold-paper-airplane-contest

***Debriefing questions***

1. What made your team succeed or fail? If you were to do this again, what would you do differently?
2. Did your team communicate effectively during the preparation? How could the communication be improved?

## 1A.1 WHAT IS TECHNICAL COMMUNICATION?

What do you think technical communication is all about? In the previous task, your team was asked to apply your knowledge and creativity in a practical situation. In fact, communicating your professional knowledge and ideas as well as working in a team involves various aspects of technical communication.

Your definition of technical communication:

## EXERCISE 1 FEATURES OF TECHNICAL COMMUNICATION

Now, watch a video clip that introduces the essence of technical communication.

(Video link: https://youtu.be/shCcP2auxkk)

Note down the key points as you listen and discuss the following:

| |
|---|
| a. What are some important aspects of technical communication? |
| b. What is the definition of technical communication given in the clip? |
| c. What do technical communicators do? |
| d. What are some examples of technical communication? Try to come up with your own examples. |
| e. What role do you think technical communication will play in your future career? |

## EXERCISE 2 UNDERSTANDING TECHNICAL COMMUNICATION

Below is part of a description of a technical communication course. Read and highlight key terms and elements.

What is technical communication?

Technical communications is not writing about a specific technical topic such as computers, but about any technical topic. The term "technical" refers to knowledge that is not widespread, that is more the territory of experts and specialists. Whatever your major is, you are developing an expertise—you are becoming a specialist in a particular technical area. Also, whenever you try to write or say anything about your field, you are engaged in technical communications.

Another key part of the definition of technical communications is the receiver of the information—the audience. Technical communication is the delivery of technical information to readers (or listeners or viewers) in a manner that is adapted to their needs, level of understanding and background. In fact, this audience element is so important that it is one of the cornerstones of this course: you are challenged to write about highly technical subjects but in a way that a beginner—a non-specialist—could understand. This ability to "translate" technical information to non-specialists is a key skill to any technical communicator. In a world of rapid technological development, people are constantly falling behind and becoming technological illiterates. Technology companies are constantly struggling to find effective ways to help customers or potential customers understand the advantages or the operation of their new products.

## EXERCISE 3 MAJOR TRAITS OF TECHNICAL COMMUNICATION

Riordan (2005) identified some major traits of technical communication (as shown below). Discuss how important these traits are by giving authentic examples.

Technical communication…

a. is audience centred;

b. enhances relationships;

c. enables readers to act;

d. occurs within a community;

e. is interactive;

f. has definite purposes;

g. is designed;

h. is responsible;

i. is global.

# Module 1B
# PROJECT PLANNING

## Learning objective

- Form teams and brainstorm initial ideas for the product development project

### WARM-UP DISCUSSION

1. Where do good ideas come from? Watch a video or two from the playlist available on Blackboard and discuss.
2. What are some recent technological innovations that impress you? In what way are they innovative or useful?
3. Do these products or services share anything in common? What are they?

## 1B.1 CRITERIA FOR A SUCCESSFUL PRODUCT

In this course, you are going to propose a technical product in your project. A successful product goes beyond meeting basic functionality requirements; its success involves factors including but not limited to design, user-friendliness, features costs and innovation. In your view, what makes a successful product?

### EXERCISE 1: WHAT MAKES A SUCCESSFUL PRODUCT?

In 2015, the R-Guardian team, a group of engineering students from the Chinese University of Hong Kong, won the first runner-up prize in the YDC E-Challenge 2015 with their project the “R-Guardian Anti-loss Device”. Here is a brief description of their product on educationpost.com.hk.

‘Their project, the R-Guardian Anti-loss Device, provides an innovative and reliable solution to secure and monitor people’s valuables. The system provides three levels of protection: warning alerts, the “find it” function and helpful information delivered via smartphone app. To use the system, users first place a Bluetooth tag in the valuables they wish to track, like a wallet. When the Bluetooth tag leaves a pre-set range, a warning notification is triggered on both the user’s smartphone and the tag to let him or her know that something has been lost. Even if the user misses a warning, he or she can easily retrieve the data by going back and referring to the “last location” and “disconnection time” information. R-Guardian wants to become the most caring company providing information and communications technology (ICT) by protecting the belongings which people care about and making their lives more convenient.’

Retrieved from: https://www.scmp.com/article/1840772/hkust-students-innovative-wearable-ankle-device-achieves-double-victory-ydc-e

Product introduction (with a video): https://www.r-guardian.com/


Figure 1 Working principles of Anti-loss Device

Retrieved from: http://www.hatchya.com/zh-TW/projects/30

***Questions:***

1. Why was this product successful? Do you think this product deserved the prize? Why or why not?
2. If your group were to suggest some improved modifications to the product, what would they be?

## 1B.2 BRAINSTORMING YOUR PRODUCT

Brainstorm ideas for your project with the help of the following thinking tool, SCAMPER. **Bear in mind that the product does not have to be entirely new or highly sophisticated.** In other words, it should be one that is manageable within the scope of this course.

**SCAMPER**

| Substitute | Combine | Adapt | Modify | Purpose | Eliminate | Rearrange |
|---|---|---|---|---|---|---|
| What can I substitute to make an improvement? What if I swap this for that and see what happens? | What materials, features, processes, people, products or components can I combine? Where can I build synergy? | What part of the product could I change? And in exchange for what? What if I were to change the characteristics of a component? | What happens if I warp or exaggerate a feature or component? What will happen if I modify the process in some way? | What other market could I use this product in? Who or what else might be able to use it? | What would happen if I removed a component or part of it? How else would I achieve the solution without the normal way of doing it? | What if I did it the other way around? What if I reverse the order it is done or the way it is used? How would I achieve the opposite effect? |
| | | | | | | |

## 1B.3 PROJECT OUTLINE

**Start planning the project with the help of the items below:**

1. Project title
2. Profile of potential users
3. Needs analysis of potential users
4. Proposed innovation
5. Description of innovation and application
6. Expected outcome and benefits
7. Key terms for conducting information search on print and electronic resources
8. Potential informative presentation topics
9. Working Bibliography (at least 5 items)

Indicate all the secondary sources of information the group has consulted in the library and on-line search

# MODULE 2
# INFORMATIVE PRESENTATIONS

*The learning objective of this module is to enable students to prepare and give informative oral presentations in a technical context.*

# Module 2A
# ESSENTIAL PRESENTATION SKILLS

## Learning objective

Discuss, analyse and practise general oral presentation skills

## References


Adler, R. (2013*). Communicating at work: strategies for success in business and the professions* (11th ed.). McGraw-Hill.

Cheesebro, T. (2010). *Communicating in the workplace*. Prentice Hall.

*Effective presentations in engineering and science*. (n.d.). http://www.engr.psu.edu/speaking/


### REFLECTION AND WARM-UP QUESTIONS

1. Rate your presentation skills by indicating how much you agree with each statement, with 5 being 'absolutely true' and 1 being 'not true at all'.

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. I identify some basic objectives before planning a presentation. | | | | | |
| 2. I analyse the needs and limitations of my audience. | | | | | |
| 3. I write down some main ideas first in order to build a presentation around them. | | | | | |
| 4. I incorporate both a preview and revise the main ideas. | | | | | |
| 5. I think about how to grab the attention of my audience and provide the necessary background information in the introduction. | | | | | |
| 6. My conclusion refers back to the introduction, re-lists the main points that I have discussed during my presentation and ends with something memorable. | | | | | |
| 7. The visual aids I use are simple, easy to read, and make an impact. | | | | | |
| 8. The number of visual aids enhance, not detract from, my presentation. | | | | | |
| 9. I use anxiety to fuel the enthusiasm of my presentation, not hold me back. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 10. I communicate ideas enthusiastically. | | | | | |
| 11. I rehearse so there is minimum use of notes and maximum attention paid to my audience. | | | | | |
| 12. My notes contain only key words, so I avoid reading from a manuscript. | | | | | |
| 13. I prepare answers to anticipated questions, and practice replying to them. | | | | | |
| 14. My gestures are natural and not restricted by anxiety. | | | | | |
| 15. My voice is strong and clear, and not monotonous. | | | | | |
| 16. I use my voice well by varying the pitch and speed. | | | | | |
| 17. I use pauses as appropriate. | | | | | |
| 18. I maintain good eye contact with the audience at all times. | | | | | |

2. Share your most recent presentation experience. Was it a successful presentation? Did you enjoy it? Why or why not?
3. What are your strengths and weaknesses as a presenter?
4. What makes an effective oral presentation?

## 2A.1 ORGANISING PRESENTATIONS

**EXERCISE 1 DISCUSSION**

What strategies/phrases can you use in different stages of a presentation?

| Structure | What to include/do | How? |
|---|---|---|
| Introduction | • Get the audience's attention and build interest | What is a good attention getter? |
| | • Reveal the topic | What words or phrases can you use to reveal the topic? |
| | • Apply the message to the audience | How do you show that your presentation is relevant to your audience? |
| | • Preview the main points | What words or phrases can you use to preview the main points? |
| Body | • Organise information | What organisational patterns can you use? |
| | • Use transitional phrases | What transitional phrases can you use? |

| | | |
|---|---|---|
| Conclusion | • Restate central idea<br>• Summarise main points<br>• Include closing statements | What should be restated and summarised?<br>What makes a good closing statement? |

## EXERCISE 2 IDENTIFYING TRANSITIONAL PHRASES

Watch Conrad Wolfram's *Teaching kids real math with computers* (http://www.ted.com/talks/conrad_wolfram_teaching_kids_real_math_with_computers/transcript?language=en) from 3:13 to 4:37 and note down all the transitional phrases.

Transitional phrases:

More transitional words/phrases:

| | | | |
|---|---|---|---|
| Above all | By, and, or | In conclusion, In short | On the other hand |
| Accordingly | By and large | In fact | Otherwise |
| Actually | By the same token | In my view / From my opinion | Paradoxically |
| Afterward | Consequently | In other words, as it were | Presently |
| All things considered | Even so | in the first place | Presumably |
| Another | First, Second, Third , … Finally | In the meantime | Regrettably |
| Arguably | First and foremost | In the same way | Similarly |
| As a consequence | For instance, For example, Take … as an example | Incidentally | Still |
| As a matter of fact | For this reason | Ironically | Strangely enough |
| As a result | From here on | Meanwhile | Then |
| At any rate | Furthermore | Moreover | Therefore |
| At the same time | However | Next | Too, also |
| At this point | In addition | No doubt | Ultimately |
| Be that as it may | In any case | Of course | Up till now |

Source: Wichita State University, College of Education

## EXERCISE 3 OPENING A PRESENTATION

Watch the opening of the following talks and answer these questions:

1. What is the talk about?
2. Which tense is used to introduce the focus of the talk?
3. What verbs are used to convey the focus of the talk (e.g. describe)?

| | **Sample 1**<br>Russell Foster: Why do we sleep? (0:11-1:27)<br>https://www.youtube.com/watch?v=LWULB9Aoopc | **Sample 2**<br>Dan Cobley: What physics taught me about marketing (0:12-0:35)<br>http://www.ted.com/talks/dan_cobley_what_physics_taught_me_about_marketing/transcript?language=en |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |

## EXERCISE 4 IDENTIFYING PHRASES FOR CLOSING

Watch Arthur Benjamin's *The magic of Fibonacci numbers* (http://www.ted.com/talks/arthur_benjamin_the_magic_of_fibonacci_numbers/transcript?language=en) from 5:41 to 6:14 and note down the phrases used to (1) review information and (2) close the presentation.

(1) Phrases for reviewing information:

(2) Phrases for closing the presentation:

## EXERCISE 5 VOCAL AND VERBAL ELEMENTS

Watch a sample presentation titled *Improving the Audio Quality and Safety of MP3 Players* (https://www.youtube.com/watch?v=Pz8AecB-z-g) and evaluate the presenter's vocal and verbal delivery. Write down the strategies below.

(1) Voice

(2) Pace

(3) Use of pauses

## 2A.2 EVALUATING PRESENTATIONS

You are going to watch parts of a project presentation given by CUHK engineering students (recommended by your instructor). Discuss and evaluate the performance of two of the presenters by paying attention to the following:

1. Verbal delivery

| Aspect | Presenter 1 | Presenter 2 |
|---|---|---|
| a. Fluency | | |
| b. Pace | | |
| c. Volume | | |
| d. Pronunciation | | |
| e. Rhythm, stress & intonation | | |

2. Non-verbal delivery

| Aspect | Presenter 1 | Presenter 2 |
|---|---|---|
| a. Eye contact | | |
| b. Hand gestures | | |
| c. Posture | | |

3. Content and organisation:

| Aspect | Presenter 1 | Presenter 2 |
|---|---|---|
| a. Content | | |
| b. Organisation | | |

4. Language issues/grammatical mistakes:

| Aspect | Presenter 1 | Presenter 2 |
|---|---|---|
| a. Grammar | | |
| b. Vocabulary | | |
| c. Style | | |
| d. Others | | |

## 2A.3 TIPS FOR DELIVERING AN EFFECTIVE PRESENTATION

The table below presents tips for delivery skills. Discuss and fill in the blanks.

| Advice | Explanation | Poor Example | Good Example |
|---|---|---|---|
| 1. Establish and maintain eye contact | You cannot establish a connection if you are reading from notes when you are speaking. | | |
| 2. Speak loudly to be heard | Speaking loudly ensures clear communication and audience engagement. | | |
| 3. Vary the rate, pitch and volume of your voice | Let your enthusiasm for the topic and situation drive your speaking style. | | Slow down and speak slightly louder when you're stating your thesis and your main points |
| 4. Avoid fillers | Fillers can distract the audience and diminish the credibility of the speaker. | | |
| 5. Use pauses effectively | Pauses in a presentation are important for emphasis, pacing and engagement. | | Use pauses to give your audience time to consider what you've presented, to formulate an answer to a question you've posed or to indicate the importance of what you've just said |
| 6. Keep sentences concise | Ideas are much clearer when delivered in briefer chunks. | *'Field interns, who are isolated from one another and work alone most of the time, need better technology for keeping in touch with one another while in the field.'* | *'Field interns work alone most of the time. This makes it hard for them to keep in touch with one another. They need better means of technology to stay in contact.'* |

| | | | |
|---|---|---|---|
| 7. Use personal pronouns | Speeches that contain first-person and second-person pronouns sound more personal and immediate. | *'People often ask…'* | |
| 8. Use active voice | Using active voice in a presentation enhances clarity, engages the audience and adds energy to the message. | *'Various tests were tried by engineers…'* | |

# Module 2B
# INFORMATIVE ORAL PRESENTATIONS

## Learning objectives

- Understand informative presentations
- Develop skills needed to prepare and deliver effective informative presentations

## References

Adler, R. (2013). *Communicating at work: strategies for success in business and the professions* (11th ed.). McGraw-Hill.

Cheesebro, T. (2010). *Communicating in the workplace.* Prentice Hall.

*Effective presentations in engineering and science*. (n.d.). http://www.engr.psu.edu/speaking/

**WARM-UP QUESTION**

What makes an effective informative presentation?

## 2B.1 INFORMATIVE PRESENTATIONS

Informative presentations introduce information about a particular topic to help the audience to understand a certain idea or concept. They often aim to (1) provide new and unfamiliar information, (2) extend what the audience knows and (3) update old information about a topic or an issue. Common examples include explaining a (new) concept in a particular field or demonstrating how to use a device.

What is the specific purpose of your informative presentation?

**EXERCISE 1 DIFFERENCES BETWEEN INFORMATIVE AND PERSUASIVE PRESENTATIONS**

Read the sample lines below and see if they are informative or persuasive.

| Structure | Content | Informative or persuasive? |
|---|---|---|
| Opening | 1. *'A new solar panel has been developed that can power an entire city for days and is less expensive than traditional fuel.'* | Informative / Persuasive |
| | 2. *'Solar power is the ideal form of power because it is clean, cost effective, and sustainable.'* | Informative / Persuasive |
| Body | 1. *'Living on campus is more enjoyable than living off campus because of the convenience it offers.'* | Informative / Persuasive |
| | 2. *'Some college students enjoy living on campus because of the convenience.'* | Informative / Persuasive |

| | | |
|---|---|---|
| Conclusion | *1. 'Remember, don't be a statistic. Take the time to fasten your seat belt every time you get in the car. And make sure you ask your passengers to buckle up as well.'* | Informative / Persuasive |
| | *2. 'Thousands of automobile deaths each year aren't "just random"; rather, they occur because drivers and passengers didn't take the time to click it.'* | Informative / Persuasive |

***Question***
What does this mean for you as a presenter?

## 2B.2 FIVE STRATEGIES FOR INFORMING YOUR AUDIENCE

There are mainly five ways to convey information to help the audience understand the content better.

| Approach | Points to note | Task |
|---|---|---|
| 1. Definition | You can provide definitions to help your audience understand concepts or terms. Definitions are usually followed by examples or essential features. | 1. Define a technical concept/term related to your project. |
| 2. Description | You may need to find a suitable way to describe the required concepts, terms or technical parts as descriptions can help paint a vivid picture. Provide sufficient information and appeal to the 5 senses of your audience. | 2. Describe a part of your product. |
| 3. Explanation | You can illustrate the ideas by providing an analysis of something essential or offer examples to help your audience understand better. | 3. Explain how a certain component of your product works. |
| 4. Demonstration | You may demonstrate how a certain process works through the use of props or visual aids. | 4. Demonstrate a process involved in your project. |
| 5. Narration | You can convey information by using a relevant story, which is often a good way to engage the audience. | 5. Tell a story related to your informative presentation. |

## EXERCISE 2 ANALYSING INFORMATIVE PRESENTATIONS

Watch the clips below from YouTube and analyse the strategies used.

| Presenter | Strategies Used |
|---|---|
| 1. Five Steps to Create a New AI Model (https://www.youtube.com/watch?v=jcgaNrC4EIU) | |
| 2. How Large Language Models Work (https://www.youtube.com/watch?v=5sLYAQS9sWQ) | |
| 3. Neural Networks Explained in 5 minutes (https://www.youtube.com/watch?v=jmmW0F0biz0) | |

## 2B.3 PLANNING YOUR INFORMATIVE PRESENTATION

In the informative presentation in this course, you are expected to communicate information that is relevant to your project and interesting to your peers (semi-expert audience). Read the following to understand more.

### *1. Choosing a focus*

The focus is flexible as long as the information is relevant to the preparation of your project. It can be technical concepts/theories, technical processes, relevant resources, findings in journal articles, etc. Identify technical ideas or knowledge that you think may be interesting to your peers. For example, if your project involves the use of a pressure sensor, you may gather relevant information about how a particular type of sensor works. You may also look for magazine or journal articles about sensors, form a topic and share relevant knowledge with your peers. Make sure each team member focuses on a different aspect.

Consider these questions:

a. Is the focus of my presentation suitable for the audience?
b. Is the focus of my presentation narrow enough?
c. Will I be able to provide adequate information for a 6-minute presentation?

### *2. Preparing for your presentation*

Ensure the quality of your presentation by paying attention to content, language, organisation and delivery.

Consider these questions:

a. Have I created a helpful outline (modify the one on p.6)?
b. Have I checked/Do I understand my audience's current knowledge level?
c. Have I included relevant and up-to-date references (where appropriate)?
d. Have I looked up words that I may mispronounce?
e. Have I proofread my PPT slides?
f. What strategies can I employ to convey the information more effectively?
g. Have I chosen a suitable organisational pattern for my topic and my audience?
h. Is the PPT design professional?
i. Have I made use of visual aids effectively?
j. Have I prepared effective speaking notes (if necessary)?
k. Have I anticipated questions that are likely to come up?

## EXERCISE 3 OUTLINE OF MY PRESENTATION

| Part | Ideas |
|---|---|
| Introduction | |
| Body | |
| Conclusion | |
| Questions I anticipate in the Q and A session | |

# MODULE 3
# PROPOSAL WRITING

*The learning objective of this module is to enable students to write an effective proposal for development of a new product. The product can have hardware and/or software components. The teaching content aims to guide students to produce proposals that would meet the expectations of engineering managers in industry.*

*In addition to this booklet, supplementary student materials are provided on Blackboard, including:*

- *A sample proposal, 'Cyctrack,' a software product*
- *A sample proposal, 'EcoHood,' a hardware product*
- *Other materials to facilitate completing the exercises in the course booklet*

# MODULE 3A
# INTRODUCTION TO TECHNICAL WRITING

## Learning objectives

- Distinguish the main features of technical writing, compared with non-technical genres, including the four C's
- Understand the purpose, application, and benefits of technical documents
- Know how to achieve the required register (formality level) for technical documents
- Know the general structure of technical documents
- Know an appropriate structure for your proposal assignment

## 3A.1 WHAT IS TECHNICAL WRITING?

### *(A) Overall purpose of technical writing*

To start with, think about the purpose of the document, as shown in Figure 3A.1.

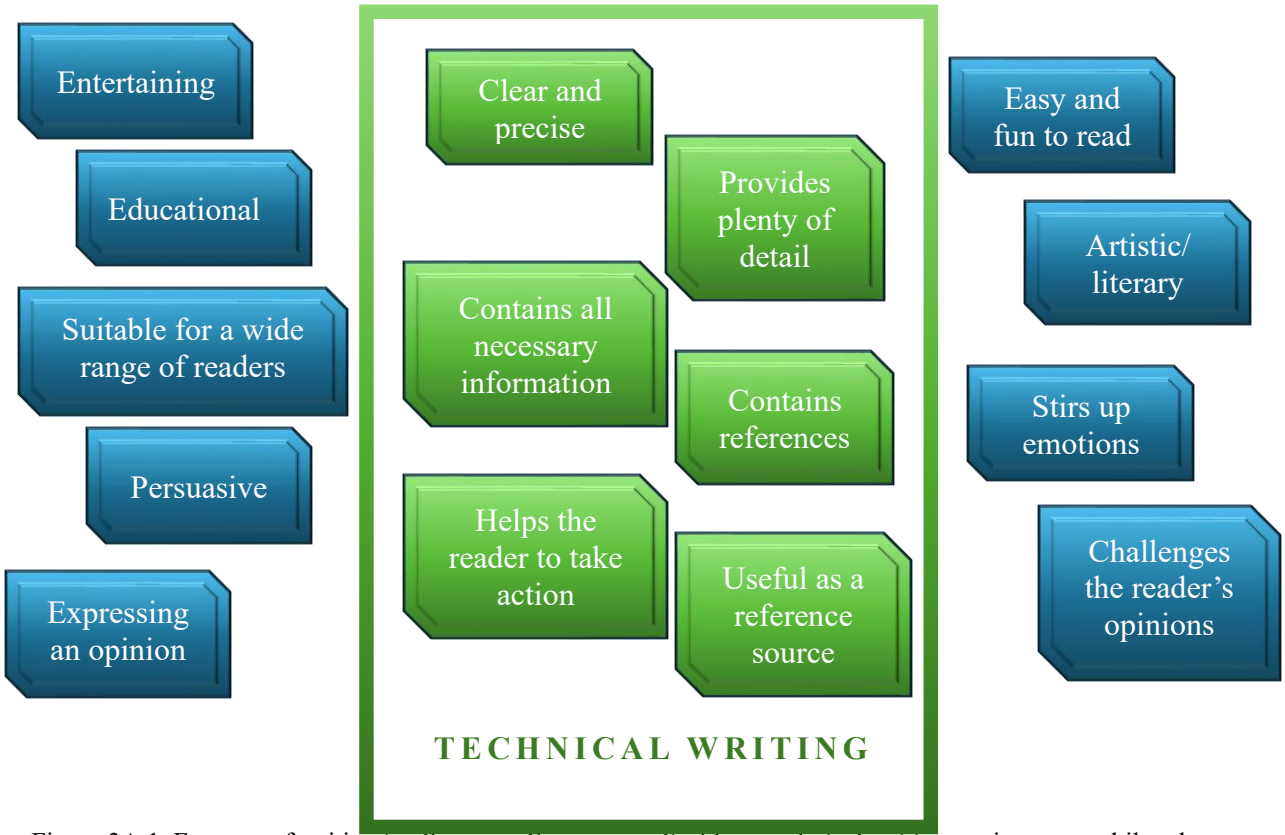



Figure 3A.1. Features of writing in all genres. Features applicable to technical writing are in green, while other possible features are in blue.

## EXERCISE 1

Suppose you work for a company that makes microwave ovens. You have been asked to write two documents for the company's latest microwave, the 'KwikZap 1000':

1. User Guide
2. Service Manual (information for engineers repairing the KwikZap 1000)

Looking at the features in Figure 3A.1 above, which of them are appropriate for each document?

## EXERCISE 2 SELF-EVALUATION

Think about your own learning needs in this module. What problems do you have with your technical writing skills? Rate yourself on this 3-point scale for each question by putting ✓ in the appropriate boxes.

This will help you to focus on your key areas of weakness as we study this module together.

| | **Rate yourself:** | | |
|---|---|---|---|
| | This is not a problem for me. | I could improve in this. | I have a big problem with this. |
| I do not really know what technical writing means. | | | |
| I do not know how to structure a long technical document. | | | |
| I do not know how to write from the reader's point of view. | | | |
| I do not know the appropriate style to use. | | | |
| My persuasive writing is weak. | | | |
| I do not know how to use figures and diagrams effectively. | | | |
| Other: (fill in your own point of concern) _____ | | | |

### *(B) Specific purposes of engineering documents*

Engineering documents are an important tool to help a project run smoothly. The way to achieve that is to ensure they focus on the required objectives.

In this section, we will look at the type of objectives appropriate to several types of engineering document that industrial engineers work with:

- Proposals
- Specifications
- Reports

Table 3A.1 shows several objectives that proposals, specifications and reports should address, with examples.

**Table 3A.1. Examples of document objectives aimed at smooth project execution**

*(a) Proposals*

| # | Objective | Example |
|---|---|---|
| 1 | Define the project | The purpose of the app is to suggest suitable background music for TikTok videos. |
| 2 | Clarify key points | The app will only suggest royalty-free music from SoundHound. |
| 3 | Specify technical requirements | The app needs to keep user data confidential. |
| 4 | Specify contractual requirements | Only the following features are included in the development cost of HKD6.5M: (X, Y and Z). |
| 5 | State exclusions | The app will be developed for iOS only, not for Android. |
| 6 | Bring the team into alignment | All team members must follow the development plan and use YouTrack to track progress and raise technical issues. |
| 7 | Avoid misunderstandings | Only existing staff will be used for this project. We will not hire any new staff. |

*(b) Specifications*

| # | Objective | Example |
|---|---|---|
| 1 | Define the scope | This specification covers an app to suggest suitable background music for TikTok videos. |
| 2 | State the technical requirements of the item in scope | The app provides a list of royalty-free music. |
| 3 | Provide sufficient detail to allow the project design to proceed | The music is selected based on keywords selected by the user from a predefined list of options. |
| 4 | Avoid ambiguity, so that the project can be designed ‘right first time’ | The app’s colour scheme and buttons must match our company’s house style. |

*(c) Reports*

| # | Objective | Example |
|---|---|---|
| 1 | Define the topic | This report covers an investigation into the way TikTok video producers typically select music for their videos. |
| 2 | State exclusions | It covers TikTok videos produced in Hong Kong only. Other video platforms and territories are not considered. |
| 3 | State how and when the research was done (so that readers can assess the quality and relevance to their needs) | Data was collected in November 2023 by sending questionnaires to a random selection of TikTok producers. |
| 4 | Include clear conclusions | Most TikTok videos use music pirated from streaming platforms such as Spotify and Apple Music. This leaves the video producers open to lawsuits. |

| | | |
|---|---|---|
| 5 | Include recommendations | To help producers find royalty-free music, we recommend developing a resource to suggest suitable music from legitimate sources such as SoundHound. |

## EXERCISE 3

Think about a time when you worked on a project team that did NOT go smoothly.

If you had to write a project plan to help the team work better together, what points would you include? Suggest 3-5 points. One point is given below as a suggestion.

1. What was the project?
2. What were the main teamwork problems?
3. What could you include in the project plan, to improve the situation?

***Our project plan for improved project execution***

1. Define a project timeline, with deadlines for completing each phase.

2. _____

3. _____

4. _____

5. _____

6. _____

**Benefits of good technical writing are not only technical**

| | |
|---|---|
| For the company | A clearly defined project helps to avoid contractual disputes between parties |
| For you | Managers highly value good technical writing skills. Many fresh graduates entering industry lack these skills |

## 3A.2 KEY FEATURES OF TECHNICAL WRITING

### *(A) The four C's*

Some experts define this in terms of four C's:


#### EXERCISE 4

Choose one of the four C's. Write a definition (in the context of technical writing) in ten words or less. The teacher will ask a few students to share their definition. For example:

> **Correctness:** The document provides accurate information with no ambiguity or errors.

#### EXERCISE 5 MATCHING

Try to match phrases relating to the same 'C'.

| | | | |
|---|---|---|---|
| 1. Unnecessary words and phrases are eliminated. | 5.All parts of the proposed product are explained. | 9. Irrelevant parts of images and diagrams are removed. | 13. Diagrams reduce the need for long explanations. |
| 2. All information is consistent, everywhere it is mentioned in the document. | 6. Technical terms are explained. | 10.Provide a glossary and/or abbreviations list. | 14. Project costs, requirements and timescale are reasonable. |
| 3. Enough information is provided to fulfil the document's purpose. | 7. Repetition is avoided. | 11. The need for the product is justified. | 15. With pronouns (e.g. it/them/this), make sure it is clear what they refer to. |
| 4. Can a non-expert understand your writing? | 8. Details match the basic product requirements. | 12. Units of measure are consistent. | 16. Assumptions are clearly stated. |

### *(B) More tips for technical writing*

| | |
|---|---|
| **Use a direct style** | Unlike academic writing, you do not need to use hedging. Also, passive voice is used much less than active voice. (We will discuss this later in this module.) |
| **No selling** | Aggressively 'selling' your idea is NOT the main purpose of technical writing. Therefore: |
| **Avoid exaggeration and hyperbole** | Tell it how it is. Be realistic and reasonable in your claims and predictions. |

## 3A.3. THE THREE MAIN APPLICATIONS OF TECHNICAL WRITING

Most technical writing is for one of the following purposes:

| **Scientific** | **Industrial** | **Informative** |
|---|---|---|
| *Examples:* | *Examples:* | *Examples:* |
| Lab reports<br>Journal papers | Funding proposals<br>Specifications<br>Internal reports<br>Manufacturing procedures<br>Training manuals | Reports for public use<br>Technical journalism<br>Websites relating to engineering<br>Wikipedia articles |

Table 3A.2 shows the main style differences between these applications.

**Table 3A.2. Style differences between technical writing applications**

| | Scientific | Industrial | Informative |
|---|---|---|---|
| Level of detail |  |  |  |
| Amount of background information provided |  |  |  |
| Uses technical terms |  |  | Avoid using technical terms if possible |
| Technical terms are explained and defined | Only new or unusual terms explained | Most terms should be explained | |
| Impersonal (does not mention the writer) | Yes | No | Yes |
| Uses passive voice | Yes | No | No |
| Uses tables and figures |  |  |  |
| Document title | Long and detailed | Short and precise | Short and attention grabbing |

## EXERCISE 6

Suppose you are investigating the problem of desktop PCs malfunctioning due to cockroaches getting inside. You find some relevant documents to read. Extracts from the documents are shown below.

Read the extracts below. For each one, decide which type of application it is most suitable for: scientific, industrial, or informative. Refer to Table 3A.2 above as a guide.

Try to identify the features of each extract that are distinctive for that application.

### *Extract 1*

> While businesses seek to reduce IT costs, frequent PC breakdowns are causing a headache for many companies. Breakdowns seem to be particularly common in areas where the working environment is outside the office, where conditions may not be clean. In many cases, infestation with cockroaches and other insects is the main cause of PC failure in non-office areas, resulting in inconvenience, costly downtime, and lost orders.
>
> Across industry, businesses are investigating a wide range of possible solutions to this problem. This is creating a market opportunity for manufacturers and installers of PC cases and accessories. In this article, we review some of the solutions that have recently come on the market. Our experts share their thoughts on which ones are effective, and which ones to avoid.

### *Extract 2*

> Every PC breakdown incident costs at least HKD10,000 due to lost working time. In order to improve efficiency, we therefore need to increase the reliability of PCs within our company. As part of an efficiency improvement project, we investigated 28 PC breakdown incidents and found 6 of them were caused by cockroach infestation. 5 out of these 6 incidents affected PCs located in warehouse areas.
>
> Several possible solutions exist for this problem, including:
>
> 1. Upgrade PC cases in warehouse areas to IP-rated cases, to prevent insects from getting in.
> 2. Install mesh screens over every opening in the case, including ventilation ports and slots for spare equipment.
> 3. Relocate PC cases to special clean cabinets, with only the keyboard, mouse and monitor outside.
> 4. Remove PCs entirely from affected areas and replace with iPads.

### *Extract 3*

> Cockroaches and other insects cause PC breakdown by obstructing airflow. As a result, the CPU temperature increases, eventually causing the IC to activate its self-protection system and shut down or stop.
>
> A survey of 58 local companies was conducted to identify common causes of PC breakdown. Survey participants were selected as a representative

sample of professional PC users in Hong Kong, including academic, industrial, and commercial. The survey also explored the environment in which the PCs are kept, and the type of routine maintenance performed on the PCs. As Figure 1 illustrates, the survey results show a strong correlation between PC breakdown, PC use in an environment where insects are likely to occur, and poor or infrequent maintenance.

## 3A.4. LANGUAGE FEATURES OF TECHNICAL WRITING

Technical writing need not be over-complex. To be effective, it needs to be clear, direct and focused on its objective—namely, to convey needed information to the reader.

In this module, we will cover a few relevant language features in each section. For this section, we focus on:

- **Register –** the writing style should be not too formal, not too informal
- **Structure –** organise the information clearly so that it follows a flow, or 'story'
- **Paragraphing –** Use well-formed paragraphs to guide the reader from point to point, and make the document easy to understand

### *(A) Register: How formal?*

The writing style should be

- NOT TOO INFORMAL → Informal writing does not look professional
- NOT TOO FORMAL → Formal writing is difficult to read and understand

To achieve the correct level of formality for industrial technical documents, follow the guidelines in Table 3A.3.

**Table 3A.3. Guidelines for formality in industrial technical documents**

| | Topic | Guideline | Example |
|---|---|---|---|
| 1 | Contractions | Do not use them | We **can't** proceed if **it'll** be too expensive.<br>↓<br>We **cannot** proceed if **it will** be too expensive. |
| 2 | Phrasal verbs | Try to use a one-word synonym instead. | We will **push on** with our proposal.<br>↓<br>We will **proceed** with our proposal.<br><br>This will **speed up** the development.<br>↓<br>This will **accelerate** the development. |
| 3 | Active and passive voice | Use active voice as much as possible. | The plan **will be executed**.<br>↓<br>We **will execute** the plan. |
| 4 | Formal synonyms | Use common words instead of formal alternatives. | There is no **necessity** to furnish a '**commence'** button.<br>↓<br>There is no **need** for a '**start'** button.<br><br>We will **utilise** the existing **methodology**.<br>↓<br>We will **use** the existing **method**. |
| 5 | Everyday abbreviations | Avoid everyday abbreviations. Write the phrase in full, or reword it. | ASAP → as soon as possible<br>OK → satisfactory, acceptable |
| 6 | Technical abbreviations | Well-known abbreviations can be used to make the writing more concise. | App ✓<br>Phone ✓<br>PC ✓<br>Mac ✓<br>HTML ✓<br>TCP/IP ✓<br>CPU ✓ |
| | | If the abbreviation is not widely understood in the industry, you should define it (in brackets) at first use. Also, consider including a glossary (list of terms and abbreviations used). | HEPA (high efficiency particulate air) filter |

## EXERCISE 7 PHRASAL VERBS

This exercise is to familiarise you with one-word synonyms for some phrasal verbs. These words are suitable for use in a document such as your proposal assignment.

| PHRASAL VERBS |
|---|
| we will **come up with** a design |
| the project will **come off** well |
| the cost will **go up** |
| the battery will **run down** quickly |
| users often need to **fix up** their headsets |
| this problem will be difficult to **get over** |
| this problem will be difficult to **get round** |
| we can **get through** the work in 1 month |
| users may have to **start over** |
| we should not **pass up** this opportunity |


## EXERCISE 8

Revise the following passages, making any necessary changes to achieve the appropriate formality level for a technical proposal.

***Passage 1***

**Proposal: Food & nutrition app for children**

> Our app's gonna provide a really cool way for kids to learn about healthy food. They use their phone camera to snap a pic of their dinner plate. The app uses AI to figure out what's on the plate, and shows all the yummy (and yucky) food ingredients. It'll let them get to know what's healthy and what isn't. Sweet!

***Passage 2***

**Proposal: An app that provides an ESG (ethical, social and governance) score for shares on the Hong Kong stock market**

> A colossal majority of investors nowadays seek to amplify the ethical composition of their investments. To support them in identifying investments with high ESG ratings, a mobile phone application is proposed that evaluates the ESG performance of each stock on the Hong Kong stock exchange. An aggregate ESG score is indicated on the screen after the user's stock portfolio has been entered into the application.

### *(B) Structure*

A technical document should be organised in sections. The main reasons for doing this are:

1. It gathers related information together in one section, making the document easier to understand.
2. The document follows a 'story line' or natural flow, allowing the reader to understand your thinking at each stage.

Other advantages of structuring your document are:

3. During the writing process, it helps you to make sure you included all needed information.
4. A structured writing process helps you to clarify your own ideas and identify any problems and difficulties related to the subject of the document.

**The rubber duck method**

According to Wikipedia, "In software engineering, **rubber duck debugging** (or **rubberducking**) is a method of debugging code by articulating a problem in natural language. The name is a reference to a story in the book *The Pragmatic Programmer* in which a programmer would carry around a rubber duck and debug their code by forcing themselves to explain it, line by line, to the duck."

When writing your assignment, imagine you are trying to explain the topic to your rubber duck. If the duck can understand your ideas, then probably your manager can, too.

### *(C) General structure for technical documents*

In general, many industrial technical documents (such as reports, proposals and specifications) will follow a 4-part structure similar to that shown in Table 3A.4.

**Table 3A.4. Typical document structure for reports, proposals and specifications**

| Type of document | Report | Proposal | Specification |
|---|---|---|---|
| SITUATION | Background: what is the context of your investigation? | | What is the project are working on? What is the equipment you are specifying? |
| EVIDENCE | What did you investigate? What evidence did you collect? What does the evidence show? | | Specify the design requirements of the equipment |
| PROBLEM | What did you discover about the situation? | | Is there any missing information? |
| SOLUTION | What are your recommendations for solving the problem? | What possible solutions are there? Which solution do you prefer, and why? How can your solution be implemented? | What needs to be done to complete the specification? |

### *(D) Recommended structure for your proposal assignment*

In this course, we recommend you adopt the structure shown in Table 3A.5 for your proposal. This is not compulsory, but it works well for most topics. Each section is covered in more detail later in this module.

The word count percentage is a suggestion for guidance, not a strict rule. Sections marked with the symbol 📊 are likely to contain images, figures, and tables—these are not included in the word count. Sections marked * are optional for your assignment. Including them will give your work a more professional feel.

**Table 3A.5. Suggested structure for proposal assignment**

| | Section | % of word count | Suggested contents |
|---|---|---|---|
| 1 | Title page | | Proposal title, names of authors, date, course number |
| | Table of contents | | |
| | Front matter | | Other preliminary information such as:<br>• Anti-plagiarism declaration<br>• Glossary of terms and abbreviations used*<br>• List of tables and figures* |
| 2 | Executive summary | 5% | A brief version of the entire proposal |
| 3 | Introduction | 10% | Describe the overall situation relating to your proposal, so that the reader can understand the context. Briefly introduce your product.<br>Give a brief overview of the rest of the proposal. |
| 4 | Proposal context/ background 📊 | | This can be divided into: |
| | | 20% | • Problem statement: Explain what need your proposed product can fulfil. Describe the evidence indicating the need exists. |
| | | 15% | • Possible solutions: Briefly describe a few possible ways of fulfilling the need (including existing solutions, if any). State which is the chosen option, and why. |
| 6 | Product description 📊 | 35% | Describe your solution. You need sufficient detail that the reader can see: (1) it meets the need, (2) it is the best available option, and (3) it is feasible. |
| 7 | Project development plan 📊 | 10% | Provide a costing, timeline, and estimated manpower requirements. Include a justification of why your project is feasible. |
| 8 | Conclusion | 5% | State the benefits of adopting your proposal. Give the reader a call to action. |
| 9 | References | | A references list in IEEE style. |
| 10 | Appendices 📊 | | Supporting information and evidence, such as data sheets.* |

A note on references

| |
|---|
| A suitable number of references for your assignment is around 5-10. While we understand that you are likely to find most of your references by searching online, try to use high quality, authoritative references as much as possible. |
| Authoritative sources include:<br>• Academic journal articles<br>• High quality newspapers and periodicals<br>• Encyclopedias and reference books, including Wikipedia<br>• Published reports<br>• Master's and PhD theses |
| If you are not sure how to start finding high quality references, staff at the University Library will be happy to help you. |
| References in your assignment must be shown in IEEE style. See https://ieee-dataport.org/sites/default/files/analysis/27/IEEE Citation Guidelines.pdf for a helpful style guide. |

## EXERCISE 9

Two sample proposals are provided for you: 'Cyctrack' (a software product) and 'Ecohood' (a hardware product). Choose one of these. Working in a small group of 2-3 students, skim through the proposal, mainly paying attention to the overall organisation and structure. Answer the following questions:

1. Does the proposal follow the structure in Table 3A.5? If not, what are the main differences?
2. Is there a glossary explaining terms and abbreviations used?
3. Which sections use the greatest number of images, figures and tables?
4. How many possible solutions are provided? Does the proposal clearly state why the authors' proposal is the preferred option?
5. Does the report look attractive and tempting to read? If so, how does it achieve this?

# MODULE 3B
# WRITING AN INTRODUCTION

## Learning objectives

- Know the content required in a proposal introduction
- Know the objectives of a proposal introduction
- Know how to describe trends in data, in relation to the need that your proposal aims to meet

## 3B.1 GETTING STARTED

### EXERCISE 1 WARM-UP

Read the following news article and answer the questions that follow.

**Buzz off! 'Mosquito' aims to drive away teens**

A Welsh inventor claims to have found the perfect solution to rowdy youngsters — noise.

Howard Stapleton says his device, the "Mosquito," emits an uncomfortable high-pitched ultrasonic sound that can be heard by children and teenagers but almost no one over 30.

It has successfully driven away noisy teens from a grocery store in the Welsh town of Barry and a shop in Stapleton's home town Merthyr Tydfil, making smoking, lounging and foul-mouthed youths a thing of the past.

The ability to hear high frequencies deteriorates with age, but some adults might still be able to hear the Mosquito. No one except young troublemakers appears annoyed, however.

"All I'm getting is pats on the back," Stapleton told Reuters. "No bricks thrown at me yet."

He said teenagers he had talked to welcomed the device too, because they used to be intimidated by gangs hanging around the shops.

The Mosquito has turned Stapleton into a media star, with appearances on British TV and radio and interest from as far afield as Australia, the United States and Canada.

***Source:*** "Buzz off! 'Mosquito' aims to drive away teens," NBC News. Accessed: Nov. 14, 2023. [Online]. Available: https://www.nbcnews.com/id/wbna10269421

1. What inspired Howard Stapleton to invent the "Mosquito"?
2. What does the "Mosquito" do?
3. How does the "Mosquito" function?
4. Has the "Mosquito" been successful in solving the problem identified by the inventor? Explain your answer.

## 3B.2 STRUCTURE OF PROPOSAL INTRODUCTIONS

### *(A) Main content*

The first section of the main text of your engineering project proposal is the Introduction. According to the assignment guidelines, your introduction should contain:

- The problem or opportunity addressed
- Your proposed innovation
- The predicted significance/impact of the project/product.

**EXERCISE 2**

Scan the Introduction of the sample proposal 'Cyctrack' and list the four subsections that are included in the Introduction:

1.1 P__ __ __ __ __ __ S__ __ __ __ __ __ __ __

1.2 P__ __ __ __ __ __ __ S__ __ __ __ __ __ __

1.3 Innovation I__ __ __ __ __

1.4 O__ __ __ __ __ __ __

### *(B) What is required in each sub-section?*

Table 3B.1 shows a good way to structure a proposal introduction. This is not the only way, but it is effective for most proposals.

**Table 3B.1. Example structure for a proposal introduction**

| # | Sub-section title | Expected content |
|---|---|---|
| 1 | Problem Statement | Who is experiencing the problem addressed by your proposal?<br>What is the problem? |
| 2 | Proposed Solution | What are you proposing to make?<br>What are your invention's main features? |
| 3 | Innovation Impact | How does it address the problem?<br>Is it innovative? In what ways? |
| 4 | Overview | How is the rest of your proposal structured? |

Later sections of the proposal will provide more detail on all the topics listed above, so the introduction does not need to provide long discussions or details.

**EXERCISE 3 ANALYSIS OF SAMPLE INTRODUCTION**

The following extracts are from the Introduction section of the 'EcoHood' sample proposal. Read the extracts and answer the questions following each.

### *Extract 1. Problem statement*

> Respiratory Personal Protective Equipment (PPE) plays a major role in protecting medical staff [during] COVID-19. Many clinicians use low-cost disposable masks. However, these can be less effective than respirators, and have a high environmental impact. Respirators provide protection against air-borne pathogens, as well as providing a physical barrier to avoid transmission from surfaces and particles in the air.

> Respirators that can be continuously worn by front-line health staff are preferred over respirators that are frequently taken off, as they reduce hygiene problems associated with handling the masks. This means respirators should be comfortable for prolonged use.

*Questions*

1. Who is affected by the problem?
2. The extract states one problem directly, and implies one other problem. What are they?
3. Before reading ahead, can you already guess what the proposed solution is?

***Extract 3B. Proposed solution***

> In this proposal, we demonstrate a design for a low cost hood-type respirator, which can be provided in all medical facilities in both developed and developing countries. It can also be built from parts that the user can purchase or make locally.

*Questions*

1. Based on this extract, the proposed respirator has two main features. What are they?
2. Why are these two features important?
3. Why did the author mention building the respirator from parts? (Look at the full text of the Introduction to answer this question.)

***Extract 3. Innovation Impact***

> To meet cost and comfort considerations, this proposed product meets the need for a cheap, full-face, pressurised, air-purifying respirator that can be made from low-cost and widely available components. Another important factor is that broken parts can be replaced by the user, with standard parts available in the local market.

*Questions*

1. What are the main unusual features of the proposed respirator design?
2. Why is it important that parts can be sourced locally?
3. Since low cost is an important factor, would you expect the respirator design to be innovative, high-tech and stylish?

***Extract 4. Overview***

> In the “Context” section, we describe the existing market situation and the product requirements. Next, the “Product description” section details the proposed design, explains our choice of materials for the components, shows how the design meets the requirements, and describes users’ reactions to trials of the prototype.
>
> This is followed by a development plan, outlining the project’s staffing requirements, timeline and costing. Finally, our conclusion explains why we consider the project to be viable and what will happen next when the project is approved.

*Questions*

1. What is the main purpose of providing an overview of the remaining sections of the proposal?

2. Does this overview mention all the sections required in a proposal? (Refer to the course notes for Module 3A, “Introduction to Technical Writing.”) If any sections are not mentioned, do you think they need to be added?
3. Proposals need to give an impression of confidence in the proposed design. How does this overview achieve this?

## EXERCISE 4 GROUP DISCUSSION (DURATION: 20 MINUTES)

In your project team, complete the following tasks:

1. Identify a group chairperson (i.e., an individual to lead the group discussion activity) and a note-taker.
2. Discuss the questions in Table 3B.1, rows 1-3.
3. As group members conduct the discussion, the note-taker will write a detailed record of the group’s discussion ideas in the form of a table (see Table 3B.2 below for the layout). Categorise your group’s ideas into the respective columns. Use extra writing space if necessary. Keeping a detailed record of your group’s discussion is important as these notes will be useful in the actual writing of your project proposal.

**Table 3B.2. Summary of Proposed Group Innovation**

| Problem Statement | Proposed Solution | Innovation Impact |
|---|---|---|
| | | |

## EXERCISE 5 MINI-PRESENTATIONS AND PEER FEEDBACK (DURATION: 30 MINUTES TOTAL)

There are two parts to this exercise.

### *Part A: Mini Presentations*

Preparation: 10 minutes

Presentation: 3 minutes/group; 15 minutes for the whole class

1. As a group, prepare a short PowerPoint presentation to convey a summary of the main ideas discussed in Exercise 4 above. The actual design of the PowerPoint presentation is up to the decision of each group. However, there should be no more than three content slides (i.e., excluding the title slide).
2. On the title slide, write the name of your group's innovation product (e.g., *Cyctrack*).
3. Appoint a group spokesperson.
4. The group spokesperson will deliver a 3-minute presentation on behalf of their group, summarising the main ideas that are discussed and outlined in Table 3B.2. In the PowerPoint slides, summarise the content and include only key words/phrases from Table 3B.2.

### *Part B: Peer feedback*

1. This is an individual task. Your instructor will tell you which group's presentation to evaluate. As you listen to that group's presentation, evaluate the strengths/benefits of the **product** and weaknesses of each group's proposal **idea**.
2. Complete the following Feedback Form individually.
3. After the presentation, give the Feedback Form to the group whose project proposal idea you evaluated.

***Mini-Presentation Feedback Form***

Group Name:

Proposed Product Name:

Evaluated by:

| **Strengths/benefits**<br>(focus on the product) | **Areas for improvement**<br>(focus on the idea) |
|---|---|
| | |

## 3B.3 IMPROVING PERSUASIVENESS OF A PROPOSAL THROUGH EVIDENCE-BASED WRITING

The aim of the ELTU2014 proposal assessment is to produce a document that will convince the funding agency of the viability of your proposed innovation. Viability means that your product addresses these points:

- It solves an actual, real-world problem.
- It fulfils the needs of the target user.
- It is appealing to your target user.
- It has market demand.
- It is technically feasible.
- It is financially feasible.
- It is a sustainable solution:
    - environmentally – its environmental impact is minimised;
    - financially – after your plan finishes, the product will make a profit in the long term, or its operating costs can be met by the organisation;
    - operationally – after your plan finishes, ongoing resource needs such as manpower, server space and network bandwidth can be met.

To achieve persuasiveness of your proposal, it is important to support your writing by including relevant evidence showing viability in all these aspects.

Some tips on writing persuasively are included in Section 4 (“Writing a Product Description”). For now, complete the following activity to help you think about evidence you may need to collect to make your proposal persuasive.

### EXERCISE 6 TOWARDS AN EVIDENCE-BASED PROPOSAL INTRODUCTION

In your group:

1. Review the detailed notes that you have prepared in Exercise 3 (Table 3B.2). Identify and highlight all ideas may require strengthening with evidence from reliable sources.
2. Discuss the type(s) of evidence required for each highlighted idea.
3. Identify possible sources of information where necessary evidence may be obtained.
4. Complete Table 3B.3 below (an example is given for you, in italics).

**Table 3B.3. Evidence needed to improve persuasiveness**

| Content | Type(s) of Evidence | Possible Sources of Information |
|---|---|---|
| *Hong Kong teenagers have an obesity problem* | *Percentage of Hong Kong teenagers who are overweight/obese* | *Statistics from Department of Health, Hong Kong* |
| | | |
| | | |
| | | |
| | | |

## 3B.4 Language for Describing Trends

An important aspect when writing background information for the Introduction is the ability to describe prevailing trends to highlight the seriousness of a problem and the need for a solution.

The University of Manchester Academic Phrasebank is an excellent reference resource that contains useful expressions for language forms to describe trends. This is a handy online reference that you should refer to often when writing the Introduction section of your proposal.

Refer to https://www.phrasebank.manchester.ac.uk/describing-trends/ for useful expressions for describing trends.

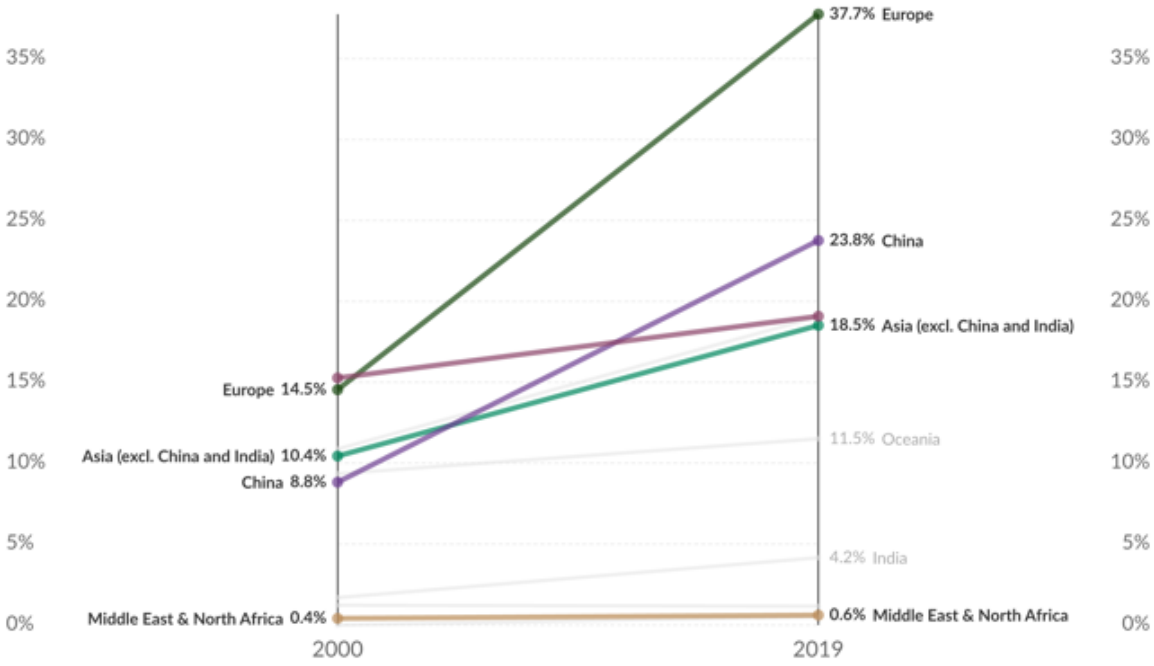
### EXERCISE 7 WRITING TASK – DESCRIBING TRENDS

Study the information given in Figure 3B.1. Then, use the Phrasebank to help you write a short paragraph in which you:

1. Identify the problem;
2. Describe the seriousness of the problem;
3. Emphasise the need for a solution.

After you have written the paragraph, use a highlighter to highlight all the expressions that you used from the Phrasebank.

## Share of plastic waste that is incinerated, 2000 to 2019

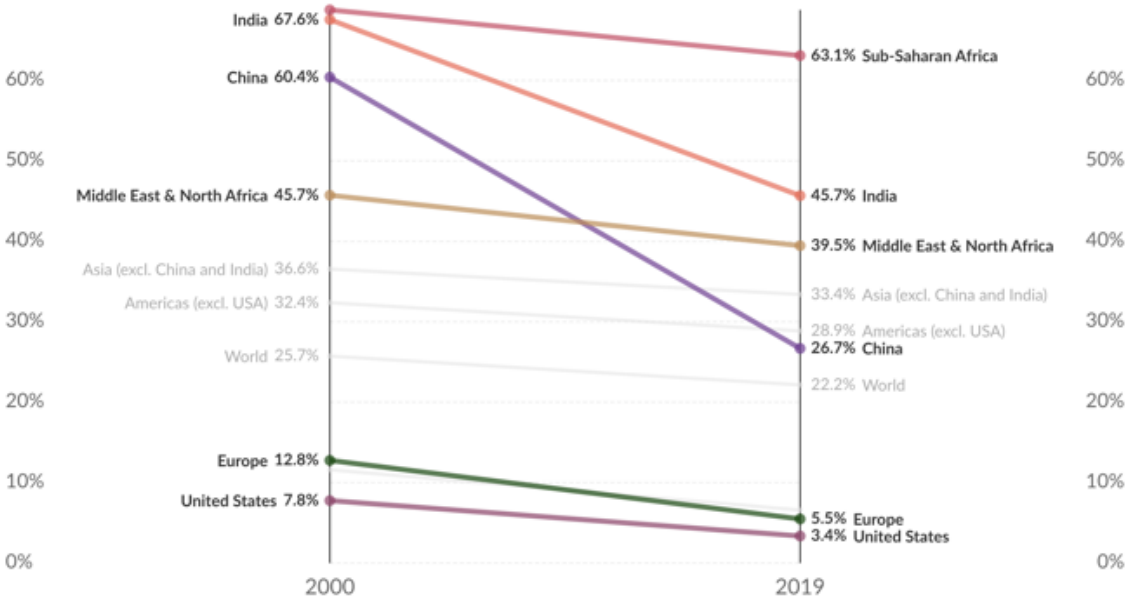



**Data source:** OECD (2023) OurWorldInData.org/plastic-pollution | CC BY
**Note:** Regional aggregates were calculated by Our World in Data and are based on those specified by the OECD[1].

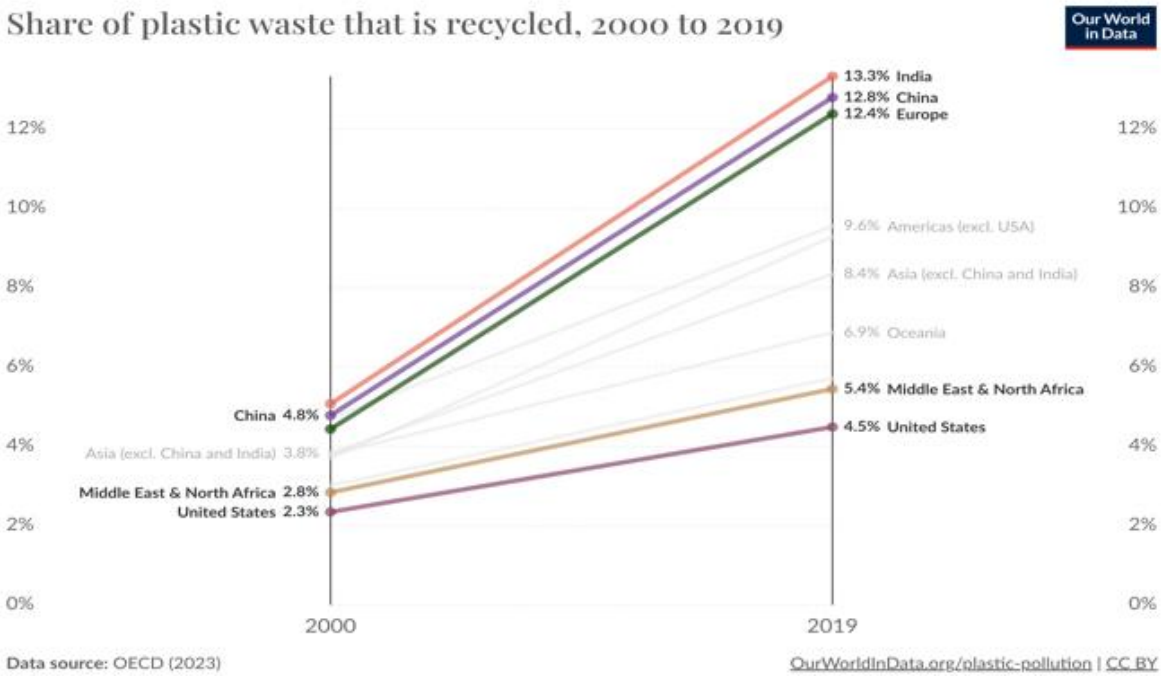
**1. OECD regions:** The definitions of regions, as stipulated by the OECD, are: - Other OECD America: Chile, Colombia, Costa Rica, Mexico - OECD EU countries : Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden - OECD Non-EU countries: Iceland, Israel, Norway, Switzerland, Turkey, United Kingdom - OECD Oceania: Australia, New Zealand - OECD Asia: Japan, Korea - Latin America: Non-OECD Latin American and Caribbean countries - Other EU: Bulgaria, Croatia, Cyprus, Malta, Romania - Other Eurasia: Non-OECD European and Caspian countries, including Russian Federation - Middle East & North Africa: Algeria, Bahrain, Egypt, Iraq, Islamic Rep. of Iran, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, Syrian Arab Rep., Western Sahara, Yemen - Other Africa: Sub-Saharan Africa - China: People's Republic of China, Hong Kong (China) - Other non-OECD Asia: Other non-OECD Asian and Pacific countries

## Share of plastic waste that is mismanaged, 2000 to 2019

Mismanaged plastic waste is waste that is not recycled, incinerated, or kept in sealed landfills. It includes materials burned in open pits, dumped into seas or open waters, or disposed of in unsanitary landfills and dumpsites.




**Data source:** OECD (2023) OurWorldInData.org/plastic-pollution | CC BY



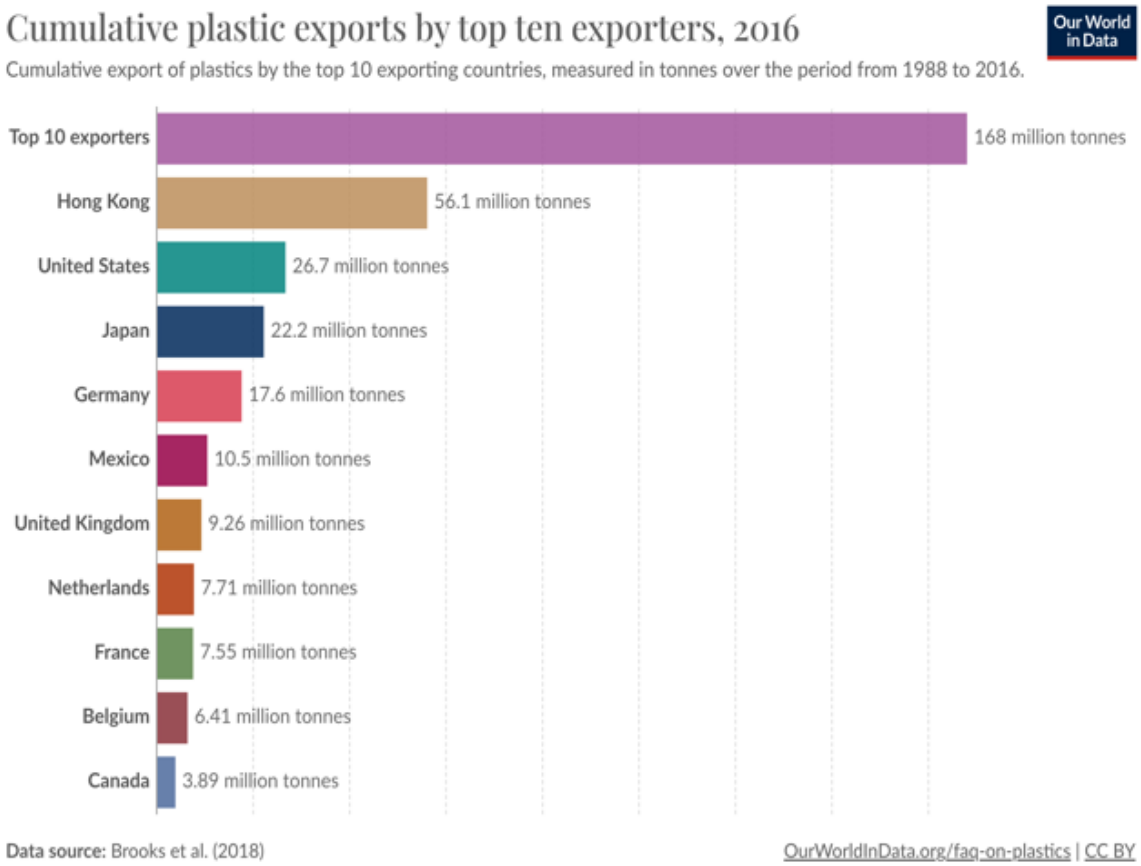




Figure 3B.1. Trends in plastic waste handling.

# MODULE 3C
# WRITING A PROPOSAL CONTEXT

## Learning objectives

- Identify the structure and language features of a proposal's Context section
- Know how to identify and explain the target users of the proposed product
- Know how to analyse and explain the users' needs, and how the proposal meets their needs
- Know how to review existing solutions to the users' needs, and explain their advantages and disadvantages
- Know three possible structures for the proposal's Context section

## 3C.1 The Proposal Context section

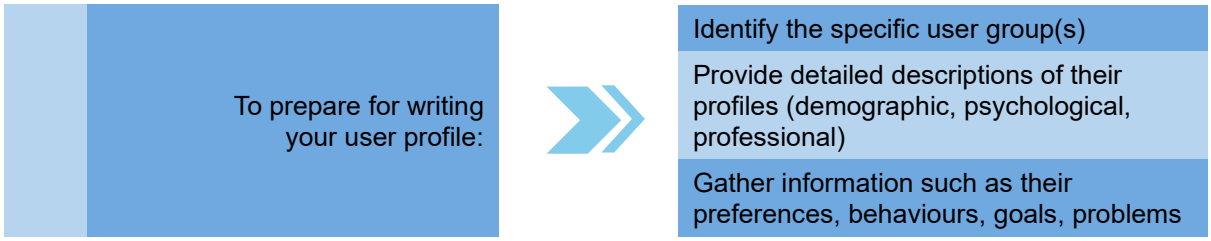
The Proposal Context section includes:

- A detailed profile of the intended users and analysis of their needs
- A comprehensive review of current technologies/techniques related to the design of the proposed product.

In this topic, we are going to explore how to effectively write this section to make a compelling case.

### *(A) User profile*

This part is an important component of a product proposal as it provides an understanding of the target users, their characteristics, requirements and pain points. A comprehensive and clear user profile helps to justify the design, development and positioning of the proposed product, ensuring it effectively meets the needs of the intended users.



## EXERCISE 1 BRAINSTORMING IDEAS FOR A USER PROFILE

To achieve this, use the 6W's framework to help brainstorm ideas for your own project. Work with your project team for this exercise.

| # | Six W's | Relevant ideas about the intended users |
|---|---|---|
| 1 | Who | |
| 2 | What | |
| 3 | When | |
| 4 | Where | |
| 5 | Why | |
| 6 | How | |

*Question to think about:* How can the above information be organised in paragraphs?

## EXERCISE 2 ANALYSING A SAMPLE USER PROFILE

Study the user profile below and answer the following questions by yourself.

> Our target users are Hong Kong youth, specifically secondary school students aged 13-18 years old, who generally enjoy gaming and are interested in becoming more physically active. We are targeting gamers as our product uses competition and video game-like visuals as a source of accountability and engagement. In fact, gaming is one of the top hobbies among Hong Kong youth, with about 41 percent of those between 16 and 24 years old stating that they play online games every day [7], making this an optimal target market. It is expected that the target users are keen to participate in some aspects of gaming, specifically racing.

1. What basic information and characteristics of the intended user are provided?
2. What are the user's preferences, behaviours and goals?
3. How is the information organised?
4. What other information can be added to enrich the text?

### *Language focus: Elaboration*

**EXERCISE 3 IDENTIFYING LANGUAGE FEATURES**

Identify the following language features that help to elaborate on the details in the sample user profile below.

1. Prepositional phrases for elaboration
2. Phrases for giving examples
3. Relative clauses providing more information about a person or a thing

> The target users for this proposal are individuals with physical challenges that limit their mobility and hinder their ability to independently fetch objects within their indoor environments. They are a diverse range of individuals, including those with physical disabilities such as spinal cord injuries, muscular dystrophy, cerebral palsy, arthritis, or mobility limitations due to aging. Because of their physical limitations, they may have to rely on mobility aids such as wheelchairs, walkers, or crutches to move around their living spaces. They are often resilient individuals who have adapted to their circumstances and aspire to regain control over their immediate environment and access objects within their reach without relying on external assistance.

### *(B) Needs analysis*

Your proposal should identify and prioritise the key user needs, based on available research findings. Needs should be assessed based on, for instance, their importance, frequency and impact on the user. For each identified need, provide a comprehensive analysis. In your proposal, you may:

- describe the issues, challenges or limitations faced by the user;
- support your analysis with evidence and examples;
- reference user feedback, testimonials or case studies to illustrate the impact of the identified needs;
- consider external factors such as trends, peer pressure, or lifestyle requirements that may influence the user's needs and expectations.

The needs analysis is important because it serves as a basis to show that your product satisfies the needs of the users.

## EXERCISE 4 STUDYING A SAMPLE NEEDS ANALYSIS

The following passage describes the creation of the original Apple mouse, a product that revolutionized the personal computer industry. Read the passage and answer the questions that follow.

**IDEO designs the original mouse for Apple**

| | |
|---|---|
| THE CHALLENGE<br><br>Create a new kind of computer navigation device that is less expensive and more reliable than any other on the market. | In 1980, Apple asked IDEO to develop a mouse for their radical new computer, the Lisa. Previous attempts at mouse design, by Douglas Englebart and Xerox PARC, yielded results that were too expensive and hard to make. The Apple mouse needed to be more reliable and less than 10 percent of the cost of the earlier versions. |
| THE IMPACT<br><br>The basic mechanism design of this first mouse is used in virtually all mechanical mouses produced to date. | To start, the design team created a cheaper, much-improved mechanism that would operate the mouse, and found that a complex, plastic “ribcage” would hold the pieces together. The team similarly tested and refined the mouse’s other key components, from the audible and tactile click of the button to the rubberized coating on the ball. A record turntable spun for days, logging “mouse miles” to check the reliability of the electromechanical assembly. |
| THE OUTCOME<br><br>The first usable computer mouse, with a “ribcage” to hold pieces together and a tactile click. | The resulting mouse proved mechanically and economically sound and was changed only slightly when adapted for use with the first Macintosh computer. The basic mechanism design is used in virtually all mechanical mouses produced to date. |

Source: “Creating the First Usable Mouse.” Accessed: Nov. 15, 2023. [Online]. Available: https://www.ideo.com/works/creating-the-first-usable-mouse

1. Who was tasked with developing a computer mouse?
2. Why was the creation of a new mouse necessary?
3. What were the key components of the Apple mouse that IDEO tested and refined?
4. How did the design team ensure the reliability of the electromechanical assembly?

5. In your own words, explain the meanings of the words listed below, as used in the passage. Do not consult a dictionary.

| # | Word | Meaning in this passage |
|---|---|---|
| 1 | Reliable | |
| 2 | Radical | |
| 3 | Yielded | |
| 4 | Refined | |
| 5 | Logging | |
| 6 | Assembly | |
| 7 | Tactile | |
| 8 | Sound | |

6. Complete the following summary of the needs analysis by filling in the blanks.

> Early mouse d_____ produced by Xerox PARC were too e_____ and un_____. To accompany their new Lisa computer, Apple decided to d_____ a new mouse design, which became the de facto standard for the modern mouse.

7. Trivia: Can you guess…
   - What was the production cost of the Xerox mouse?
   - What was the production cost of the re-designed mouse by IDEO?
   - Apart from resembling the small animal, why is a computer mouse called “mouse”?
   - How many buttons did the original Apple Lisa mouse have?

## EXERCISE 5 ANALYSING A SAMPLE NEEDS ANALYSIS

Read the sample and answer the following questions.

> Research has shown that over 90% of Hong Kong youth do not currently get the recommended one hour of moderate to vigorous physical exercise recommended by the government, and a low level of family support for exercise and a lack of friends to do sports with have been identified as major contributing factors [1]. There is a need for a product that will promote exercise to a large demographic of individuals of all skills and abilities, especially those who may be struggling with obesity or have little previous exercise experience.

1. What are the issues, challenges or limitations that the product seeks to address?
2. Is the analysis supported with evidence and examples?
3. How is the information organised?
4. What other information can be provided to enrich the text?

### *(C) Review of current technologies and/or solutions*

In the proposal context section, a review of current technologies and/or solutions plays a crucial role in establishing the choice of technology/solution to be applied in the proposed innovation and demonstrating the competitive advantage of the proposed product. This review involves evaluating and analysing the existing technologies or solutions relevant to the product's domain and helps to justify the uniqueness and value. You may provide the following:

- **Define the scope of the review**, focusing on technologies, design options, and/or products directly related to the proposed product. Identify the specific criteria for evaluation, such as performance, functionality, usability, compatibility, cost or any other relevant factors.
- **Review similar existing products on the market**. Discuss the relative strengths and weaknesses of these products, with a view to demonstrating the competitive advantage of the proposed product in the subsequent parts of the proposal.
- **Discuss the current state-of-the-art technologies or solutions in the product's domain based on research findings**. Refer to academic research papers, industry reports, patents, trade publications, review articles, and other reputable sources, with an emphasis on recent advancements, emerging trends and any significant breakthroughs that may impact the technological or market landscape. Provide a critical analysis of the strengths, weaknesses and suitability for the proposed product.

By writing a comprehensive, well-structured and evidence-based review in the proposal, you can effectively establish the need for innovation and showcase the advantages of your proposed product.

#### EXERCISE 6 ANALYSING A SAMPLE REVIEW

Read the sample (taken from the Cyctrack model proposal) and answer the following questions.

> The market demand for outdoor cycling apps has remained high since the first major international launch, but the features have remained limited in scope. The successful launch of Strava in 2009 demonstrated the demand for and popularity of intuitive and easy-to-use cycling apps for tracking metrics. Strava, which primarily provides user statistics through a smartphone, has also since integrated a simple social media component that enables users to follow friends and share their ride information with others [8]. This app currently has over 50 million downloads and ranks #25 overall in the App Store's "Health and Fitness" section [9]. Since its launch, the market has been inundated with other similar cycling apps. Most, like Strava and competitors Map My Ride and CycleMeter, primarily focus on the feature of tracking and sharing rides, but others such as Bike Map and Komoot have attempted to excel in detailed route planning and navigation [8].
>
> Although Strava and its competitors provide a simple means to track metrics for cyclers and identify routes, they pose safety risks. During a ride, these apps display real-time statistics (e.g., distance traveled, minutes cycled, speed) on the user's phone, which requires using a phone mount with the bike, which is dangerous, as it forces the user to look down and take their eyes off the road. The phone also has the potential to fall off when cycling across rough terrain.

Cyctrack provides a more engaging and safer cycling experience for users. The app retains the essential features of tracking metrics and providing accurate route planning while improving on multiple aspects of current apps through the use of AR visuals. Not only is the user experience much more fun and engaging by mimicking video game racing, but safety is also improved significantly with all information being displayed directly in front of the user and the equipment (glasses) worn securely on the user's head.

The demand for AR products has increased significantly in recent years, and improvements in AR technology now offer new opportunities for enriched user experience. The AR smart glasses market is estimated to grow by USD 6.21 billion within the next 4 years [10]. Additionally, the unit sales of AR glasses brands are estimated to rise to 3.9 million units by 2024, up from 410,000 units in 2021 [11]. The market for AR glasses designed for sports is similarly predicted by market analysts to experience significant growth in the next few years [12]. Currently, most offerings (e.g. Eyesight Raptor, Form Swimming Googles and Solos Smart Glasses) focus solely on displaying user stats on the glass interface. What differentiates Cyctrack from all AR competitors, is its focus on gamifying cycling, specifically, and the innovative integration of the racing experience into a mobile app through the projection of a holographic ghost rider.

*References*

[8] "Best cycling apps 2023: 21 of the best iPhone and Android apps to download," Bikeradar, 2020, [Online]. Available: https://www.bikeradar.com/advice/buyers-guides/best-cycling-apps/. [Accessed: Oct. 31, 2022].

[9] App Store. Strava: Run, ride, hike, 2011. [Online]. Available: https://apps.apple.com/us/app/strava-run-ride-hike/id426826309. [Accessed: Oct. 30, 2022].

[10] Technavio. AR VR smart glasses market size to grow by USD 6.21 billion. 2022. [Online]. Available: https://www.prnewswire.com/news-releases/ar-vr-smart-glasses-market-size-to-grow-by-usd-6-21-billion33-of-the-market-growth-to-originate-from-north-america--17-000-technavio-reports-301521030.html. [Accessed: Oct. 30, 2022].

[11] T. Alsop, "AR glasses unit sales worldwide 2024," Statista, 2022. [Online]. Available: https://www.statista.com/statistics/610496/smart-ar-glasses-shipments-worldwide/. [Accessed: Oct. 26, 2022].

[12] "Augmented reality in sport: Significant room for growth in AR in the sports field," Businesswire, November 2021. [Online]. Available: https://www.businesswire.com/news/home/20211115005722/en/Augmented-Reality-in-Sport-Significant-Room-for-Growth-for-AR-in-the-Sports-Field---ResearchAndMarkets.com. [Accessed: Oct. 28, 2022].

1. What information about competing products does the review contain?
2. How does the review show the advantages of Cyctrack?
3. What types of sources have been used to support the review? Are they good enough? What other sources would you include?

## EXERCISE 7 TEXTUAL ANALYSIS

The text below is a review of augmented reality in tourism, adapted from a journal article. Read it and complete the following questions.

As Garcia-Crespo et al. argue, the tourism industry is currently in need of technology-based integrated value-added services, which are highly dynamic and offer interactivity and entertainment [16]. Augmented Reality has proven so far to be a technology that can provide tourists, and citizens of course, with much more personalized content and services tailored to their particular needs. Specifically, AR tourist guides are able to display content upon request as tourists travel around the city, exploring the cityscape and the sites. As such, one could say that mobile AR applications allow users to explore the world by adding new layers to their reality, thus resulting in a new interactive and highly dynamic experience. Moreover, as these applications are on most (if not all) occasions accessed over mobile devices with GPS functionalities, tourists can gain additional benefits and navigate themselves interactively with the help of the direct annotations of the selected locations.

In addition, information within an AR application is delivered through the use of various multimedia formats. Such formats, as explained, range from sound and image to video clips, 3D models and hyperlinks that may direct the user outside the application. The combination of AR technology, the availability of such multimedia and the careful design of the mobile application can altogether allow tourists to create lists of their favourite POIs equipped with embedded information, i.e., the aforementioned multimedia files. Further to this, it should be noted that, while geo-location and AR tags may trigger the delivery of multimedia content, the content itself could be designed so as to provide further connectivity between the AR application and others, thus offering additional benefits to tourists. For example, AR can superimpose layers of information drawn from online social networks, while at the same time offering a built-in solution for directly updating the user's social network account(s). As a result, a tourist may instantly share or exchange information and tips, and express her/his opinion with others within the application or outside, over a much larger network. This suggests that such mobile AR applications can offer further added value to tourists by introducing the concept of connectivity and the sharing of experiences.

Moreover, a mobile AR application, being highly portable, can function as a tourist guide that delivers information upon request, thus minimizing on the one hand, the effect of information overload and on the other hand the effect of irrelevant information. Information overload can occur when tourists are overwhelmed by the transmitted information regarding historical sites, museum exhibitions, the pace of the navigation and so forth. Information overload's effect further increases when the user considers the information redundant or beyond her/his particular knowledge level [18]. AR can significantly help museums, heritage sites, cities and tourist professionals in general because information can be organized and transmitted in layers or upon request. This suggests that information can be targeted according to one's knowledge level and interests, age, profession and so forth. As a result, mobile AR applications can personalize the visit, according to tourists' desires and expectations, resulting in a much more memorable experience [19].

Finally, mobile AR applications, whether or not for tourist purposes, can be considered as 'social applications', as they offer the possibility for social interaction among the various users accessing them. As a result, it is beyond

doubt that applications leveraging the functionalities of AR "must exploit the unique characteristics of mobile devices and mobility in order to enhance and enrich the interactions allowed" [17].

*Source:* "Enhancing the Tourism Experience through Mobile Augmented Reality: Challenges and Prospects" Accessed: Nov. 15, 2023. [Online]. Available: https://journals.sagepub.com/doi/full/10.5772/51644

1. Identify expressions that are used to highlight the advantages of using AR in the tourism industry.
2. What verb tense is generally used in this review?
3. This review is taken from an academic paper. In what way do you think it is different from a review in a technical proposal? (Refer to Figure 3A.1 for guidance.)

## 3C.2 Overall organisational patterns for the whole section

Two suggested patterns, namely (1) problem-solution and (2) criteria satisfaction, can be used to organise the parts above effectively.

### *(A) Problem-solution*

- Explain the specific challenges or issues faced by the intended users.
- Provide a comprehensive review of current technologies/solutions relevant to the proposed design, discussing their strengths, weaknesses and any limitations that may hinder meeting the identified user needs.

This approach works better for products that address a known need, lack, or problem with existing solutions.

### *(B) Criteria satisfaction*

- Create a detailed profile of the intended users, analyse their unmet desires, and identify specific criteria that will be used to form a good innovation.
- Provide a comprehensive review of current technologies/solutions related to the proposed design. Evaluate these technologies against the target criteria, considering factors such as effectiveness, efficiency, usability and scalability.

This approach works better for products that create a new desire or experience for the user, rather than addressing a known problem.

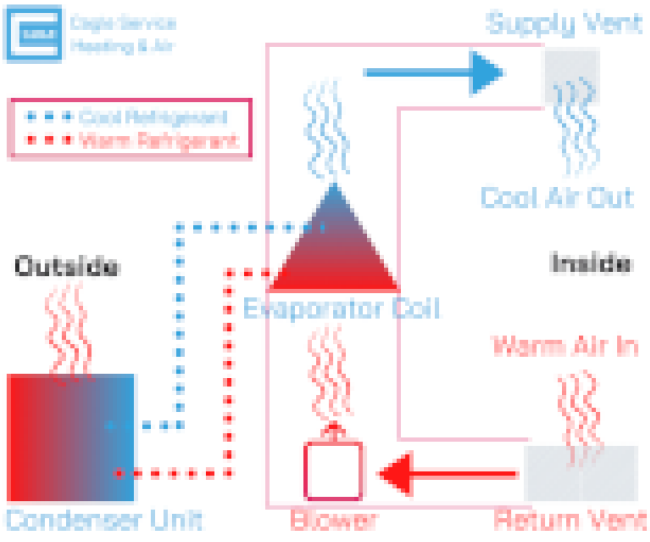
**Question:** Which one is more suitable for your team's proposal?

## 3C.3 Use of graphics

To help describe the market situation, you are strongly recommended to use not only words, but also graphics such as diagrams and images.

Table 3C.1 provides some tips for effective use of graphics.

**Table 3C.1. Tips for effective use of graphics in technical documents**

| # | Tip | Explanation |
|---|---|---|
| 1 | Use graphics as much as possible, but keep them relevant. Do not include any unnecessary content. | The first graph on plastic waste in Figure 2.1 includes unnecessary detail (lists of countries). This do not help the reader's understanding and should be removed. |
| 2 | Try to keep all your graphics consistent in style. | See Figure 3C.1 below. This example contains an uncomfortable mixture of styles: cartoon, meme, icon and screenshot, with a confusing range of fonts and styles and very little explanation. |
| 3 | Keep it professional. | Do not use clipart, memes, cartoons etc. |
| 4 | Crop and zoom photos. | For all images, crop unnecessary parts from the edges. Also, zoom the images to a generous size. Use the full width of the page. |
| 5 | Include explanation. | Make sure the information in the image can be clearly understood. If necessary, add an explanation in the main text, or in the caption. |
| 6 | Include a caption. | Each table and figure should be numbered and captioned. |
| 7 | Do not repeat the same information in both figures/tables and text. | Suppose you provide a screenshot of your proposed app showing features such as buttons, textboxes and dropdown boxes.<br>In the text, you do not need to state "This screen will include button A, textbox B and dropdown box C," because this is obvious from the screenshot. |
| 8 | Use graphical elements within text and tables to aid understanding. | For example, you can use:<br>Arrows to show A » leads to B<br>Labels ❷ with explanations<br>This is a callout<br>Callouts |
| 9 | Use high resolution images. | This looks unprofessional:<br>  |

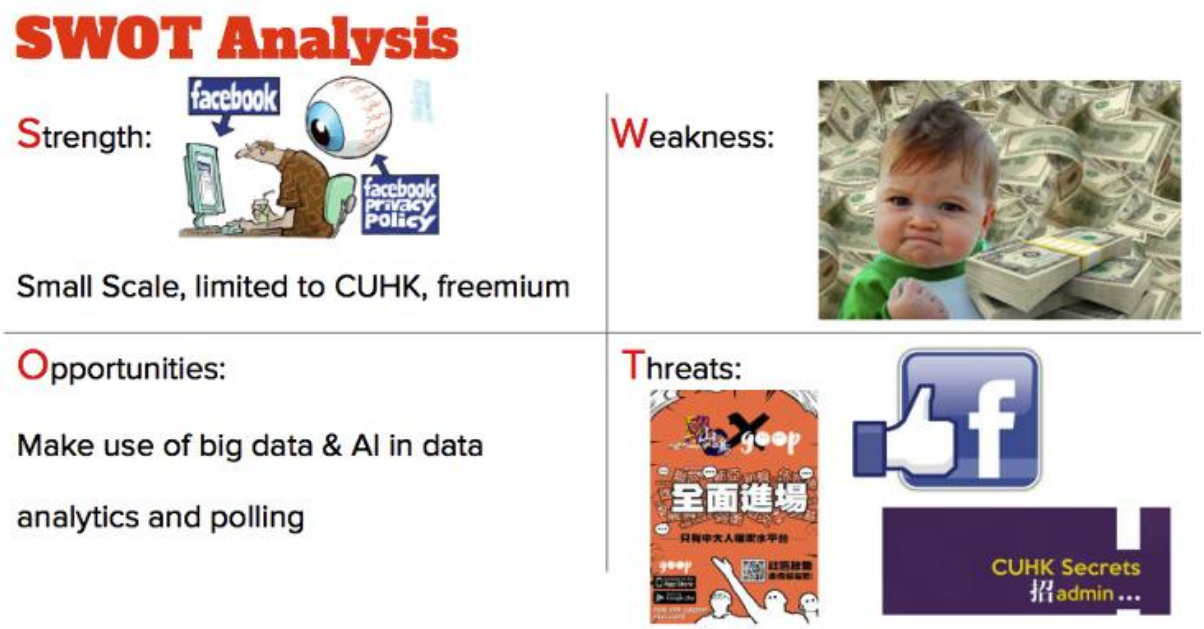



Figure 3C.1. Example of a confusing graphic from a proposal by previous students on this course

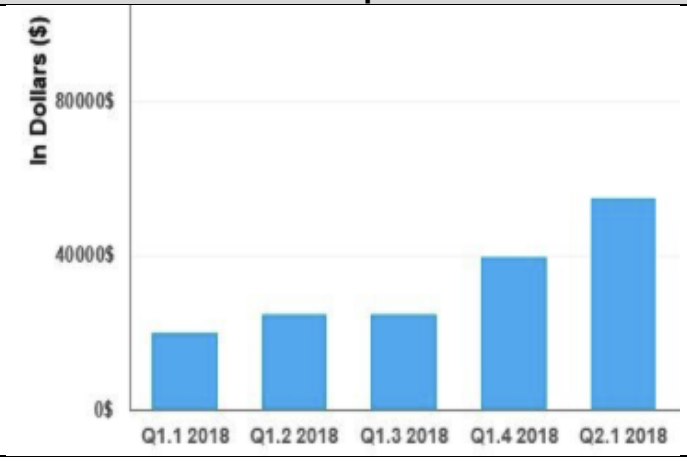
### *Choose the appropriate type of graphic for numerical data*

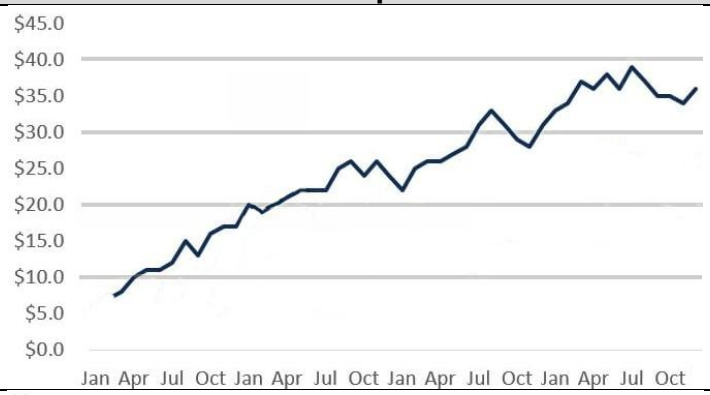
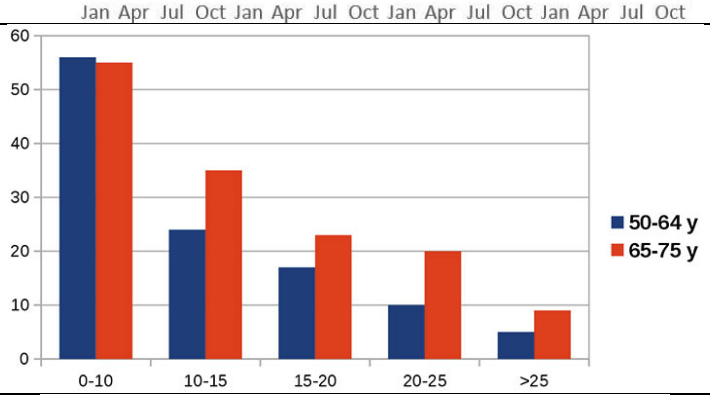
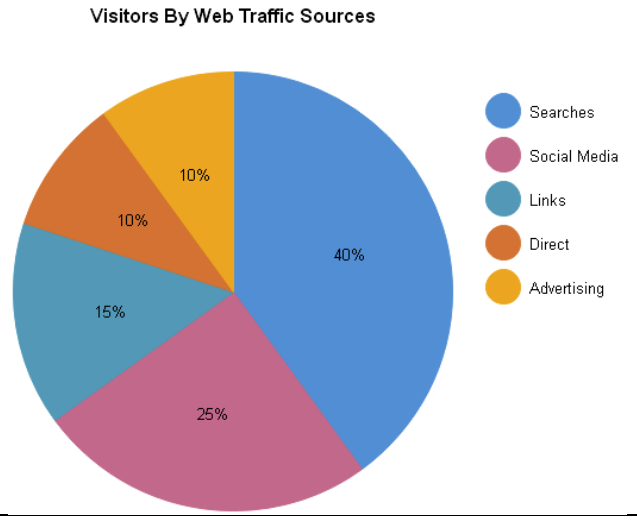
Numerical data can be presented in a table or a figure.

| If the exact numbers are important ▼ **Use a table** | If trends or differences are more important than exact numbers ▼ **Use a figure** |
|---|---|

If you are presenting data in a figure, remember that each type of figure is appropriate for different types of information. Table 3C.2 offers some guidance.

**Table 3C.2. Guidance on selecting the appropriate type of figure to present numerical data**

| Type of data | Example | Graph style |
|---|---|---|
| Trends with a small number of data points (≤10) |  | Bar graph |

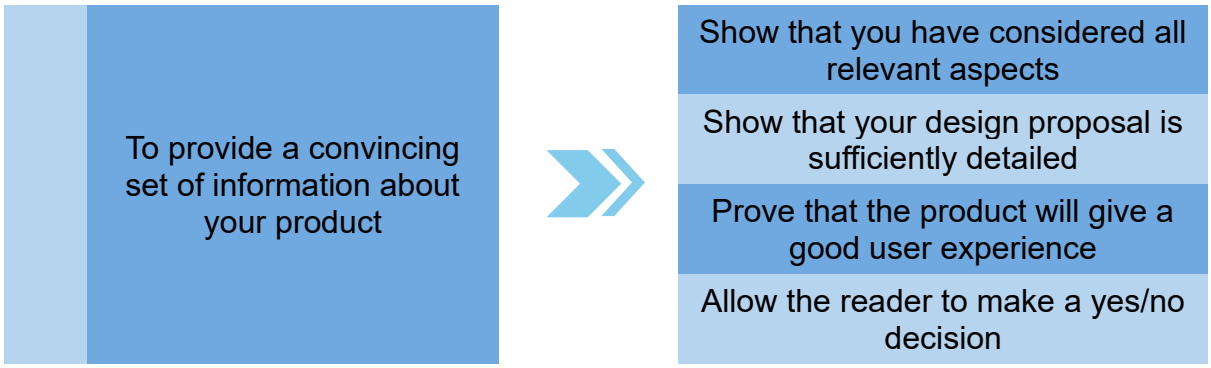
| Type of data | Example | Graph style |
|---|---|---|
| Trends with many data points (>10) |  | Line graph |
| Differences between individual values (e.g. this year vs. last year) |  | Bar graph with different colours for the values being compared |
| Differences between trends (e.g. Facebook vs. Instagram usage over 10 years) |  | Line graphs with different coloured lines for the trends being compared |
| Fractions of a total (≤6 different fractions) |  | Pie chart<br><br>(Bar chart is better for >6 fractions) |

# MODULE 3D
# WRITING A PRODUCT DESCRIPTION

## Learning objectives

- Know what information to include in your product description
- Know how to guide the reader's understanding of your idea, by explaining the design from high level to low level
- Know how to organise your points into related groups
- Understand how to apply the concept of the 'minimum viable product'
- Know how to persuade the reader to accept your proposal
- Know how to justify your design decisions

## 3D.1 WHAT IS THE PURPOSE OF THE PRODUCT DESCRIPTION?



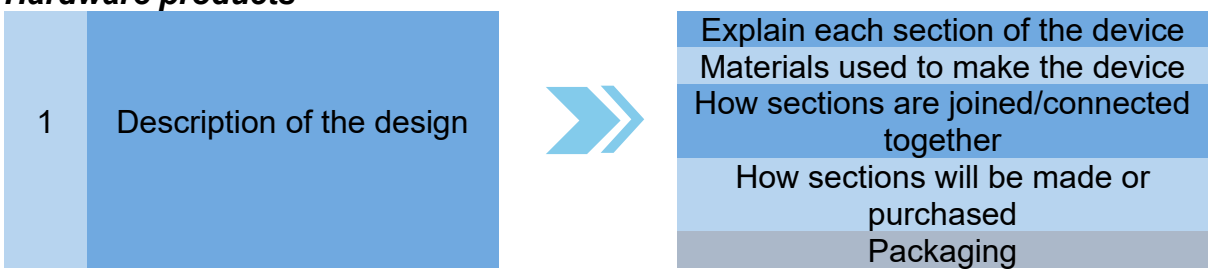

## 3D.2 WHAT INFORMATION SHOULD BE INCLUDED?

Below is a list of topics that you can consider including. Some of these are explained in more detail in the following sections.

For both hardware and software products, the topics are divided into five categories. For your assignment, you can consider writing five subsections, each covering one category.

Topics marked * would be covered in detail in a real-world proposal. However, for your assignment, we do not expect you to have enough knowledge or information to cover them properly. We suggest you mention them briefly, but do not go into detail.

***Hardware products***



| | | |
|---|---|---|
| 2 | Key product features<br>For example: | Waterproof/dustproof (IP requirements)*<br>Cleaning<br>Strong enough<br>Battery life<br>Styling follows company guidelines |
| 3 | Maintenance | Consumables (parts expected to be replaced regularly, e.g. filter)<br>Accessories<br>Whether the device is repairable<br>Spare parts for repair |
| 4 | User information | User guide<br>Website |
| 5 | Compliance with regulations | Consumer safety regulations*<br>Electrical safety*<br>Recyclability*<br>Fire protection* |

***Software products***

| | | |
|---|---|---|
| 1 | Description of the design | Explain each page/screen of the app<br>Platforms (Android, iOS, etc.)<br>How the user moves from one page to another<br>Error/problem handling (e.g. no internet connection)<br>Data content (maps, databases etc.)<br>Distribution (Play Store, iTunes, etc.) |
| 2 | Key product features<br>For example: | Easy to use<br>Human languages supported<br>Look and feel (colours, styling etc.)<br>Connection/relation to other apps (e.g. can login with Google/Facebook) |
| 3 | Security | Protecting user confidentiality*<br>Encryption*<br>Avoiding hacker attacks* |
| 4 | User information | User guide<br>Website<br>Customer support |

| | | | |
|---|---|---|---|
| 5 | Monetisation |  | Do users have to pay?<br>How will you collect money from users?*<br>Are you expecting the product to make a profit? |

**EXERCISE 1**

Choose one of the example proposals provided: EcoHood (hardware) and Cyctrack (software). Skim through the product description section, and notice how it divides up the information into subsections. Also notice whether it covers each of the items listed above.

Does the product description section contain any additional topics not mentioned above?

## 3D.3 WHICH PROJECT PHASES SHOULD BE INCLUDED?

New product development projects go through several phases. Not all phases need be included in your project. For example, if you are developing an app, you can choose whether to include the marketing and distribution of the app as part of your project.

> In the next section of this module, we will study phases typically included in engineering development projects.

Having chosen which phases to include, you need to specify the cutoff point (where your project will finish) and which phases you chose to exclude. For example:

> Our project will develop and test the app so that it is fully prepared for distribution. The app backend will be set up on our server, ready for users. We will also prepare the user guide and develop the app's icon. However, the project does not include:
>
> - Distribution of the app through app stores such as Play Store
> - Marketing of the app
> - Sales and customer support

The next section of your proposal (Product Development Plan) will provide details on what is planned for each project phase.

## 3D.4 DESCRIBE YOUR PRODUCT FROM HIGH LEVEL TO LOW LEVEL

### *(A) Flow from high level to low level*

Your description must be carefully structured to guide the reader's understanding. Think about your product from the viewpoint of someone who knows nothing about it. Start from a high level (describing the main purpose and function) and work through to low level (details about specific features, screen layout etc.).

Table 3D.1 shows examples of the information needed at each level.

**Table 3D.1. Examples of product information divided by level**

| Level | Typical information to be included |
|---|---|
| **High level** | Name of the product |
| | Main purpose of the product |
| | Who is expected to use the product, and when |
| | Any limitations, such as who is NOT expected to use it, or functions/purposes that are excluded |
| **Medium level** | What the product does – all the functions visible to the user |
| | Operations that the user cannot see (e.g. looking up a database, performing calculations, preventing overheating) |
| | Outline description of each part or screen |
| | Materials used (for hardware products) |
| | Platforms supported (for software products) |
| **Low level** | Detailed description of each part or screen |
| | Details of how the parts/screens work together, and the flow/connection between them |
| | Describe the look and feel of the product (colours, fonts, icons, switches/buttons etc.) Explain the basis for design choices, e.g. to be consistent with existing products by the same company. |
| | Details of how the product works inside, e.g. what database lookups are done, how calculations are performed |
| | What data/images are needed, and how they will be collected (for software products) |
| | How the product will be manufactured (for hardware products) |
| | How the app will be monetised (for software products) |

### *(B) How can we decide whether an item of information is high or low level?*

High level information requires no other information to understand it. On the other hand, low level information can only be understood if the reader has already seen the high level information.

## EXERCISE 2

Suppose you are proposing to develop an app to help consumers choose an appropriate air conditioner (A/C) for their home.

Below is a list of phrases showing information that should be included in the product description section.

Working in a group of 3-4 students, sort the phrases into 3 groups: high, medium and low levels, following the guidance in Table 3D.1 above.

Next, arrange the cards into a logical order for your product description section.

### *Phrase list*

| Phrases |
|---|
| 1. The purpose of the app is to recommend an appropriate A/C to purchase. |
| 2. The app will only recommend domestic A/C units currently available for purchase in Hong Kong. |
| 3. State whether the A/C database will be updated regularly, and how this will be done. |
| 4. Show details of what will be on each screen. |
| 5. State what information will be shown about each A/C unit. |
| 6. State how the app will analyze the answers to the questions and select A/C units to recommend. |
| 7. State how the data about available A/C units will be collected. |
| 8. The app design includes the following screens:<br>• Home screen<br>• Questionnaire screen<br>• A/C unit recommendations screen |
| 9. Show the list of questions that the user will be asked. |
| 10. Describe the look and feel of the app (colours, fonts, icons etc). |
| 11. The app then analyses the answers and shows a list of recommended A/C units. |
| 12. The app is aimed at domestic consumers who need to install a new A/C or replace their old one. |
| 13. The app is named ‘Cool It’. |
| 14. Give details of the flow between screens. |
| 15. When launched, the app asks the user a series of questions, to collect data needed to identify appropriate A/C choices. |

### *(C) Which low level design details should be included?*

Be careful not to overload the reader with excessive details. Include only the information needed to help the reader judge the merits of your proposal. If you want to include further details, put them in an Appendix.

To help you decide whether to include a detail, consider the following guidance:

1. If this information is not included, is the reader likely to ask for the information?
2. Does this information have a significant impact on the product's cost or performance?

Table 3D.2 shows some examples of details that may not be necessary at proposal stage.

**Table 3D.2. Design details that are typically not necessary at proposal stage**

| HARDWARE PRODUCTS |
|---|
| Internal materials used |
| Internal layout |
| Wiring diagram |
| Details of external markings (labels, logos, badges) |

| SOFTWARE PRODUCTS |
|---|
| Programming details (e.g. which languages/frameworks will be used) |
| Server details (which server will be used, expected storage and upload/download capacity) |
| User interaction details (e.g. minimum password length) |

**EXERCISE 3**

Which of the following details would you consider including in your proposal? Note, this is not a simple yes/no answer; state which factors should be considered when deciding whether to include the information.

***Hardware products***

1. The weight of the device
2. Whether the device needs internal protection against overheating
3. Which colours will be used for the case

***Software products***

1. What the user should do if the username or password is forgotten
2. How much storage space is required on the user's device
3. What notifications are generated by the app

## 3D.5 LANGUAGE FEATURES

### *(A) Showing the relative importance of your product's features*

In the product description section, the text can easily become just a list of features, which can be dry and boring to read. However, it is better to show the relative importance of the points listed, for two reasons:

1. You need to emphasise the distinctive features—what makes your idea special. Your product still needs to have 'regular' features (such as a login screen), but the only reason to mention these features is to show that your idea is sufficiently well developed to be feasible.

2. In a real engineering project, you need to specify the 'minimum viable product' (MVP; see below). Your proposal needs to distinguish between the MVP and 'nice to have' features.

> **What is the 'Minimum Viable Product'?**
>
> Engineering design projects tend to expand, because everyone in the team will add their own ideas for extra functions and features. This can make it difficult to complete the project on time and within budget. Therefore, it is important to specify the absolute **minimum** set of features required to make an acceptable release of "version 1." This is known as the Minimum Viable Product (MVP).
>
> All those extra features suggested by the team are sometimes called "Nice To Have" and can be added in later versions.
>
> Ideally, your proposal should specify your MVP feature set. You can mention the 'nice to have' features as well, if you wish.

Here are some ways to indicate the relative importance of features. For example, suppose your app's most distinctive function is a large 'Help' button on the home screen. You could mention it in one of these ways:

- The key/critical/essential features of our product include a prominent 'Help' button.
- Most importantly, our product features a large 'Help' button. ['Features' is a verb in this example.]
- A distinctive feature of our app is the prominent 'Help' button.
- In line with our app's user-friendly philosophy, its most characteristic feature is a large, distinctive 'Help' button.

Here are some ways you can mention a low-priority feature. For example, supposing you are considering adding a 'More Suggestions' button to your app, but it is not part of your MVP:

- Extra/Additional/Optional features could include a 'More Suggestions' button.
- If time allows, we will consider adding a 'More Suggestions' button to the app.
- A 'More Suggestions' button can be added, but this is not a core function in our design.

### *(B) Arranging your points into related groups*

Earlier, we studied how to structure the description into high, medium and low level features.

Within each level, you should gather related topics together. Here is one way you can arrange the necessary information:

| HARDWARE PRODUCTS |
|---|
| Work through each section or system, for example: |
| Control system |
| Connectors |
| Display |
| Case |

| SOFTWARE PRODUCTS |
|---|
| Work through each screen or main function, for example: |
| Home screen |
| Data input screen |
| Output screen (e.g. results of the search) |

#### EXERCISE 4

Consider again the app to help consumers choose an appropriate air conditioner (A/C) for their home.

Suppose a student has written the following badly organised text in the description section. Reorganise the points made into related topics. Also, add sub-headings or topic sentences to indicate where each sub-section starts.

> The search results screen will show recommended A/C units that the user can buy. The recommendations will be based on the user's input information, which includes the room size, facing direction (north, south, east or west), and main purpose of the room. Recommendations are selected using a points system; for example, a room used for sleeping will score higher points on the 'low noise level' ranking. Recommendations can be arranged in order of suitability (based on the ranking calculated as per Table 1) or price. The price of A/Cs shown will depend on what price range the user entered on the input screen, which switches to the search results screen when the user taps the "Recommendations" button.

## 3D.6 PERSUASION IN TECHNICAL PROPOSALS

The writing style should be mainly factual and descriptive.

You do not need to use a pushy, persuasive style like a sales document.

Instead, persuade the reader by showing that your project is a viable and exciting solution to a genuine problem.

One way to do this is by justifying your design decisions. Table 3D.3 shows some examples.

**Table 3D.3. Justifying design decisions: Examples**

| | Design decision | Connective | Justification |
|---|---|---|---|
| 1 | The app will be developed for Android only, | as this | will reduce the development time and cost. |
| 2 | We will provide the User Guide as a downloadable PDF, | which | is more environmentally friendly than a paper version. |
| 3 | No USB charging cable will be included, | because | most users are likely to have a suitable cable at home already. |

For in-depth coverage of persuasion in technical writing, see this excellent article. (Reference: https://pressbooks.nscc.ca/profcommunication/chapter/unit-7/)

### EXERCISE 5

Similar to the examples above, write a sentence justifying each of the following design decisions:

1. App users need to obtain a username and password to log in.
2. The device's outer case will be made of polypropylene instead of aluminium.
3. This toy will have no small detachable parts.
4. Free use of the app will be limited to 14 days.

You can also flip the order of the sentence, with the justification first. For example:

| | Connective | Justification | Design decision |
|---|---|---|---|
| 1 | In order to | reduce the development time and cost, | the app will be developed for Android only. |

## EXERCISE 6

Rewrite examples 2 and 3 in Table 3D.3, and also your answers to Exercise 5, putting the justification before the design decision.

### Consider using a noun form

You can sometimes write the justification in noun form. This may be shorter and more elegant than the infinitive ('to' + verb) form. For example:

- for security reasons
- for cost and weight reduction
- for better monetisation
- for environmental protection

## EXERCISE 7

Suppose you propose to develop a robot vacuum cleaner. Watch this video (https://www.youtube.com/watch?v=hoY2YxLGV98) and, based on the information provided, develop an outline of your product description section. Your outline should be structured in a hierarchy, like this (using whatever number of sections you think is appropriate):

**Sub-section A**

- Point A1
- Point A2

**Sub-section B**

- Topic B1
  - Point B1-1
  - Point B1-2
- Topic B2
  - Point B2-1
  - Point B2-2

# MODULE 3E
# THE PRODUCT DEVELOPMENT PLAN

## Learning objectives

- Know what to include in the product development plan to make it convincing
- Know how to apply industry-typical product development models
- Know how to prepare a simple costing for your project
- Know how to develop a simple Gantt chart to indicate the project timeline

## 3E.1 Structure of the Product Development Plan

The Product Development Plan demonstrates to the prospective funding agency that your innovation idea is implementable. This section can be subdivided, as shown in Table 3E.1 below.

In each subsection, the usual approach is to give a brief summary in a few short sentences, followed by tables or diagrams showing the necessary details.

**Table 3E.1. Subsections required in the Product Development Plan**

| | Subsection | Required content |
|---|---|---|
| 1 | Resources required | Personnel requirements:<br>• What skills/specialities are required<br>• How many people<br>• How many months of manpower per person<br>Financial requirements:<br>• A detailed costing showing all the items that need to be purchased, and a reasonable cost for each item<br>Other resources:<br>• Mention any other resources needed, such as: server space and bandwidth, office space, access to workshop facilities, support from other departments such as sales and marketing, use of in-house services such as printing and logistics |
| 2 | Project phases | List the phases that your project will work through. For each phase, give a brief explanation of:<br>• What work will be done<br>• What deliverables (results) will emerge<br>• Any special resource requirements (such as support from other departments) |
| 3 | Development timeline | Overall time to complete the project<br>Expected duration of each phase |

Here are some extracts from the Cyctrack sample proposal.

***Extract 1. Resource requirements***

> Our team is requesting a total funding of HKD 1,612,800 for the development of *Cyctrack*. Table 1 contains an itemised list of necessary expenditure that will incur for the development and launch of *Cyctrack*. These resources include the hiring of personnel for specific purposes, technical-related expenditure and promotional expenses.

***Extract 2. Costing – Personnel***

| Item | Cost/month (HKD) | # Of Months | Total (HKD) | Details |
|---|---|---|---|---|
| Software Engineer (x4) | 112,000 [15] | 12 | 1,344,000 | To execute all design, implementation, unit testing, review, and documentation, for both the frontend and backend components of *Cyctrack*. |
| UI/UX Designer | 20,500 [16] | 4 | 82,000 | To assist in creating an intuitive and user-friendly interface design. |

***Extract 3. Description of one project phase***

> **4.2.1 Phase 1: Prototype Development**
>
> During this phase, our UI/UX Designer will plan the *Cyctrack* user interface, and our Software Engineers will build the foundation of the software system. Following the Incremental Delivery Model, this stage allows for a minimum viable product to be created. The functionality developed at this stage would encompass solely mobile app features, including track selection, navigation instructions, and the recording and display of metrics during a user's ride.

## 3E.2 PREPARING A BUDGET

### *(A) What to include in the budget*

A proposal needs to contain a detailed, itemized budget for the development of your innovative product, from the design phase, through prototype development, up to product launch. The cost items that may be included in the budget include, but are not limited to, the following:

- Detailed list and costing of all hardware components/materials;
- Cost for services and supplies;
- Equipment costs;
- Facilities rental costs;
- Salaries for required personnel at different stages of product development;
- Software/software-related costs;
- Administrative costs.

### *(B) Features of a well developed budget*

A well developed budget is:

| | | |
|---|---|---|
| 1 | Real | Not imaginary<br>Based on actual input data |
| 2 | Realistic | Reasonable (not too low or high)<br>Meets any guidelines provided by the funding body<br>Sufficient to achieve the project goals |
| 3 | Comprehensive | Covers all necessary costs<br>Includes a contingency for unexpected problems<br>Considers ongoing costs after completion of the project |

### *(C) Guidance on preparing a costing*

Figures shown in Table 3E.2 are reasonable suggestions to use as a starting point.

**Table 3E.2. Guidance on costings for a proposal budget**

| Item | Guidance | Remarks |
|---|---|---|
| **Personnel** | Graduate engineer: HKD30,000/month<br>Engineer with several years' experience: HKD50,000/month<br>Specialist (e.g. compliance expert): HKD60,000/month<br>Project manager: HKD75,000/month<br>Product testers: emolument of HKD500-1000 each | • Personnel costs are likely to be over half of your total development costs.<br>• Personnel costs include not only salary, but other costs such as MPF (pension) contributions, bonuses, recruitment costs, and other benefits such as meals. Add 30% to the basic salary to cover these. |
| **Materials and equipment** | Small quantities for development: retail price<br>Large quantities for production: 30% discount | • You do not need to cost every small value component individually. A switch costing HKD10 will make no difference to the overall budget.<br>• Allow plenty of margin for experimenting and wastage during development.<br>• Be cautious of using low priced materials from online sources such as Taobao. |
| **IT equipment** | Computers and peripherals: retail price<br>Network equipment: retail price | • Do not assume you can do all the software development on your own laptops. It is wise to assume you will purchase new, powerful and reliable equipment for the project. |

| | | |
|---|---|---|
| **Facilities** | Server space (web hosting): HKD1,000/year<br>Web domain registration: Check on godaddy.com<br>Workshop facilities (e.g. 3D printer): assume HKD2,000/day | • Consider facilities needed both during and after development. |
| **Other costs** | Travel within Hong Kong (e.g. to arrange testing): assume HKD40/km<br>Fees by external consultants:<br>• HKD5,000/small task<br>• HKD20,000/large task<br>Software licenses: at cost | • Travel costs include taxi fares and personnel time<br>• External consultants could be needed for advice on safety, compliance, certification, cyber security, and lab testing.<br>• Include licenses for any apps or online services you may need, such as Dropbox or Zoom. Do not assume free services will be sufficient. |

***Overall guidance***

- Your total budget is likely to be in 6 or 7 figures HKD. If it is less than about HKD500,000, you have probably under-budgeted.
- Include a margin for contingencies, such as computer breakdown and personnel resigning from the project.
- Under-budgeting is worse than over-budgeting, because you will find it hard to keep within budget. So, you should always budget on the safe (generous) side. Managers will be much more satisfied when your project is completed under budget.

**EXERCISE 1 GROUP DISCUSSION**

How do you ensure that your proposed budget is real and realistic? What kind of research do you need to conduct to ensure an accurate budget?

Write your ideas down. Then, discuss with your teammates.

## 3E.3 PRODUCT DEVELOPMENT PHASES

In addition to a budget, a proposal also needs to contain specific plans for the development of the product, from ideation to fruition. These include an outline listing the major phases/milestones of the project and a timeline. Prospective funding agencies need to ascertain the viability and reasonableness of your proposed innovation project, and be convinced that your proposed idea is achievable.

Developing a hardware or software product is a complex process, involving several distinct phases. There are a number of product development models to choose from, depending on the nature and complexity of the proposed innovation.

Figure 3E.1 shows simple models for hardware and software development projects. Your team must choose and follow the most suitable product development model that suits your project. You can choose the hardware or software models shown in Figure 3E.1, or use another method from your own research.

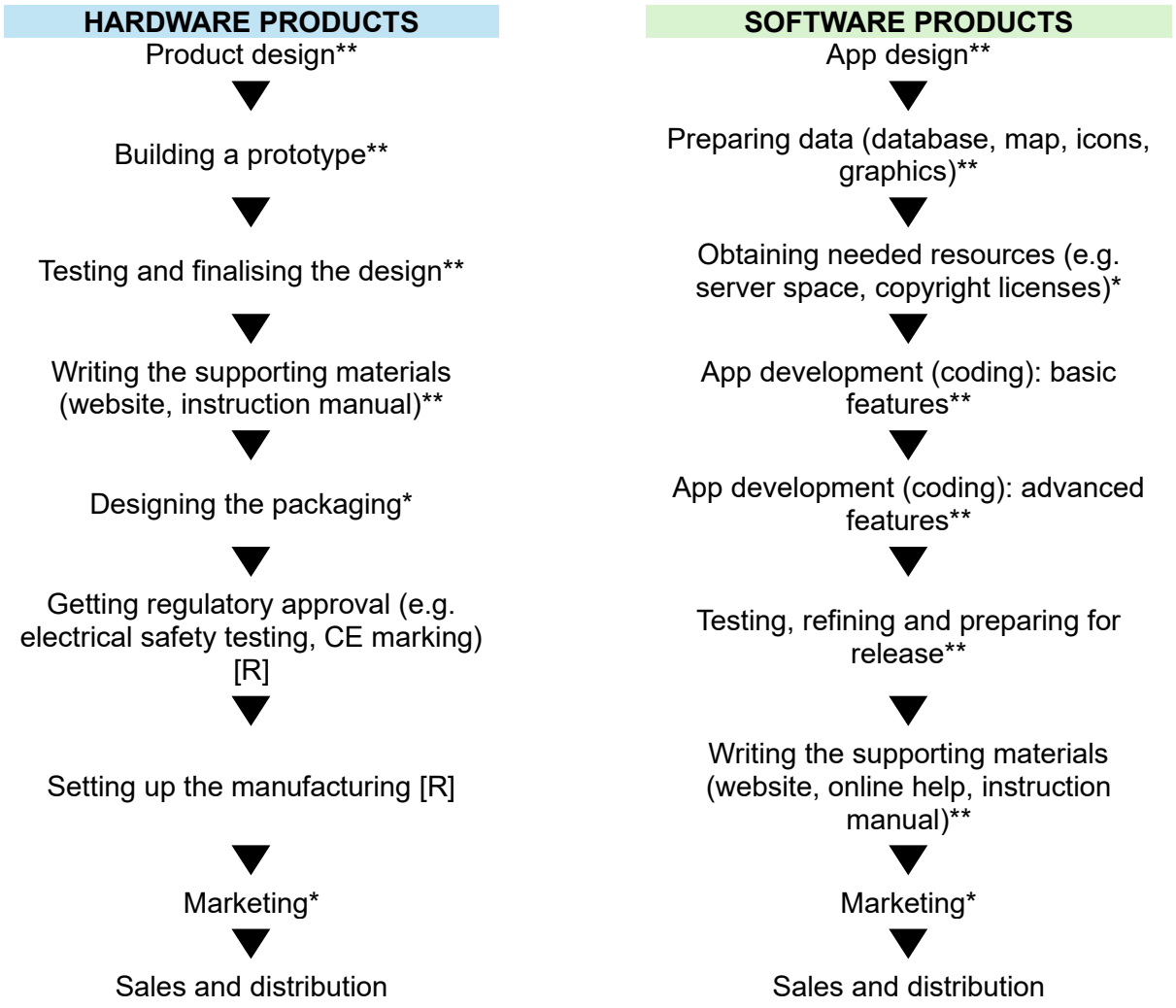



Figure 3E.1. Simple product development models

For your assignment, we recommend including only the phases marked ** in the figure above. Optionally, you can also include the phases marked * if you wish.

In a real-world engineering proposal, you would also need to include the phases marked [R], because these would likely be the engineer's responsibility.

### Real-world hardware design

An actual industrial design process for a hardware product will break up the product design and prototype building phases into multiple steps as follows:

| | |
|---|---|
| **1. Conceptual Design Stage** | Generating design alternatives |
| | Evaluating design concept alternatives |
| **2. Preliminary Design Stage** | Product architecture and configuration (main sections and basic design decisions) |
| | Materials selection |
| | Simulation and analysis using mathematical tools (e.g. stress testing, reliability analysis, safety analysis) |
| **3. Detailed Design Stage** | Finalising reliability and safety aspects |
| | Detailed design aspects (e.g. PCB layout, internal layout, fasteners) |
| | Design for manufacture and assembly |
| **4. Prototype** | Initial prototype building |
| | Prototype testing and resolving problems |
| | Final design updates based on feedback from all departments (marketing, manufacturing, safety, costing) |
| **5. Manufacturing trials** | Small scale runs on actual manufacturing equipment |

## EXERCISE 2

The following is an extract from a memo on the development of the original Apple mouse. Fill in the blanks with an appropriate word.

To: Bill Lapson

From: Dean Hovey

Re: Mouse billing to date

Date: 4 August 1980

The following is a description of the phases and monies allocated for the Mouse development program.

There are five distinct phases of the Mouse project. They are:

1. Original r_____
2. F_____ prototype
3. First prototypes
4. P_____ production of 10 units

5. Production d_____

*Source:* “Hovey-Kelley Mouse Billing.” Accessed: Nov. 15, 2023. [Online]. Available: https://web.stanford.edu/dept/SUL/sites/mac/primary/docs/hkbill.html

## 3E.4 USING A GANTT CHART TO OUTLINE PROJECT TASKS

A Gantt Chart is a visual representation outlining different stages of a project on a timeline, and is presented in the form of a horizontal bar graph (refer to the sample Proposals for simple examples of Gantt charts). Each major task and important milestones are highlighted, including start/end dates, duration, task dependencies (showing which task cannot start until another one is completed) and task overlaps. Gantt charts are a common document in project management.

For a useful introduction to Gantt charts, see this website (https://www.gantt.com/).

Simple Gantt charts can be drawn in Microsoft Word (using tables) – see the example in the Cyctrack and EcoHood sample proposals – or in Microsoft Excel (by changing the background colour of cells to show project phases). Online tools and commercial software are available for more complex Gantt charts.

## 3E.5 LANGUAGE FOR DESCRIBING ROLES, PROCESSES, AND RESPONSIBILITIES

Study the following sample sentences:

| | |
|---|---|
| **Active voice** | Apple executives thought the original computer mouse was too expensive. |
| **Passive voice** | The original computer mouse was thought to be too expensive. |

1. We use the Active Voice when it is important/necessary to identify who performs the action.
2. We use the Passive Voice when:
   - We do not know the person who performs the action; or,
   - It is not important/relevant to say who performs the action.

### *Present Passive*

Form: Am / Is / Are + Past Participle

We use the Present Passive to describe how to conduct an activity/procedure.

*Example*

Fatigue tests **are conducted** to determine the ability of the new aircraft fuselage panels to withstand stress.

3. If we wish to say who performs the action, then we can add the information with *by*.

*Example*

Fatigue tests **are conducted *by test engineers*** to determine the ability of the new aircraft fuselage panels to withstand stress.

### *Past Passive*

Form: Was / Were + Past Participle

4. We use the Past Passive to describe completed actions, events, and processes.

   *Example*

   The final design of the first mechanical mouse **was approved** after months of testing.

### *Future Passive*

Form: Will + Be + Past Participle

5. We use the Future Passive to describe something that needs to be done in the future.

   *Example*

   The final design of the product **will be approved** only after all safety requirements are met.

## EXERCISE 3 SENTENCE CONSTRUCTION

Construct ten active or passive sentences using the verb + noun phrase sets given, ensuring that the bulleted conditions are met:

- Each sentence must state who is performing the action.
- There must be a mixture of active and passive sentences.
- At least five sentences must be complex sentences.
- Four sentences must be at least 12 words long.
- Two sentences must be at least 16 words long.

1. Communicate / Design parameters
2. Identify / User requirements
3. Document / Product specification
4. Reject / safety standards
5. Reduce / Cost
6. List / Functions
7. Evaluate / Design alternatives
8. Create / Schematic
9. Select / a range of metallic alloys
10. Fulfil / Customer satisfaction
11. Determine / Cost of assembly
12. Pursue / Remedy
13. Verify / Effectiveness
14. Generate / Drawings
15. Test / Use cases [different situations in which the device can be used]
16. Assess / Manufacturing cost of components

# MODULE 3F
# WRITING A CONCLUSION

## Learning objectives:

- Know the main purposes of the conclusion section
- Understand that you must clearly state the business benefits of your proposal
- Know a possible structure for the conclusion of your proposal assignment
- Know how to include an appropriate call for action
- Know how to form a satisfying ending

## 3F.1 PURPOSE OF THE CONCLUSION SECTION

| The conclusion should do this: | But not this: |
|---|---|
| Form a satisfying ending | Summarise the whole proposal |
| Summarise the benefits of your idea | 'Sell' or promote your idea |
| Prompt the reader to take action | Beg the reader to approve your idea |

**Table 3F.1. More guidance on content and style**

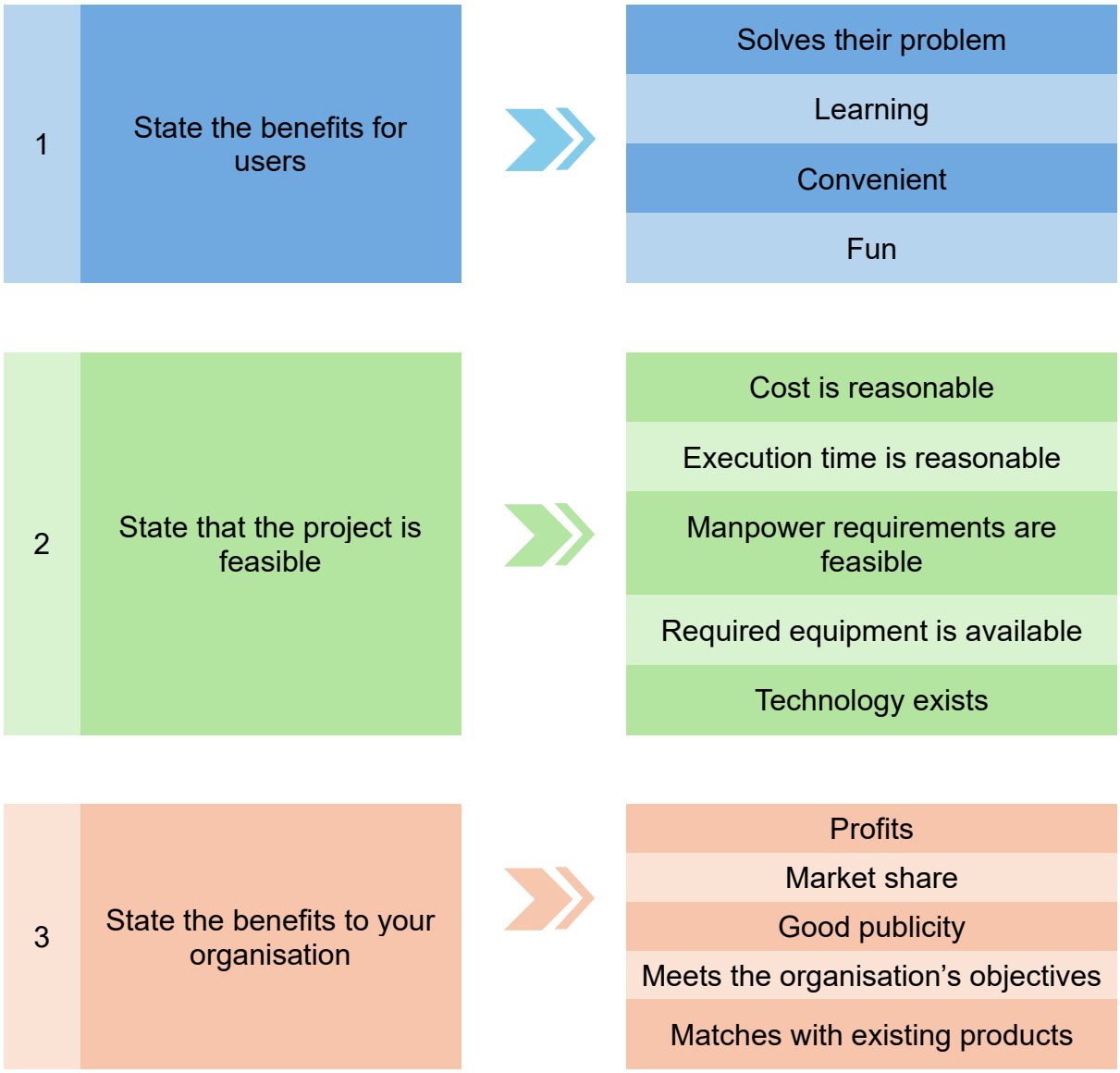
| | Topic | Guidance |
|---|---|---|
| 1 | Target word count | Around 200-300 words, or around 5-10% of the total word count |
| 2 | Preferred writing style | Clear, direct and personal. Say what "we" have done and what "we" request the reader to do. |
| 3 | Use of hedging | Avoid hedging ("may", "might", "could", "should"). Make direct claims (based on evidence presented earlier in the proposal), e.g. "Our proposed product **will** benefit medical professionals". |

## 3F.2 STRUCTURE OF THE CONCLUSION SECTION

We suggest you structure your conclusion in two parts—one or more paragraphs for each part.

### *Part 1: Emphasise your product's benefits*

This is your final chance to show that your product is a good idea. You could do this in several ways, as listed below. You do not have to include all of them—choose whichever are more appropriate or effective for your proposal.




***Part 2: Call for action***

It is very important to tell the reader what you want to happen next. For example:

- Give you funding and permission to proceed;
- Escalate your proposal to a top management committee for approval.

Finally, you can state what you will do when you get what you want. For example, you may:

- Start hiring personnel, finding freelancers, or co-opting staff from other teams;
- Purchase materials and equipment needed;
- Draw up and submit a detailed development plan.

## EXERCISE 1

We suggested some "benefits to your organisation" above. Can you think of any other benefits that you could mention in your proposal?

> We are engineers, not business majors. Why should we think about benefits to the business?
>
> *Reason 1: Engineering needs funding*
>
> Engineering is costly. In order to convince business managers to provide that money, you need to show them the benefits of your proposal. Even the greatest engineering idea in the world can succeed only if it is commercially viable.
>
> *Reason 2: You should write from the reader's point of view*
>
> Think about what the reader needs to know. If you were the manager, what would be the basis of your decision to fund the proposal? That tells you what points to emphasise in the conclusion.

## EXERCISE 2

Your conclusion should include a call for action. Look at the list of actions below. Which of them might be appropriate for your type of proposal? Answer 'yes' or 'no' to each one, with reasons.

1. Contact us for more details or if you have any questions.
2. Authorize funding of HKD1.5M.
3. Let us know if you would like to see our presentation on the project.
4. Give us a date and time to show our presentation on the project.
5. Read through our proposal carefully.
6. Approve our project.
7. Instruct the Sales & Marketing, Product Design, and Distribution departments to work with us on this project.
8. Give us permission to focus 100% of our time on this project for the next 6 months.
9. Discuss our project in your management committee.
10. Authorize us to use the design and construction facilities to build our prototype.

## 3F.3 SAMPLE CONCLUSIONS

**EXERCISE 3**

The following is the conclusion to a proposal to develop Husky, a battery-powered gadget with wheels that fits onto a supermarket shopping cart and makes the cart follow you automatically around the store.

> In this proposal, a device called Husky to make a shopping trolley follow the user around the store automatically was described. We explained the benefits of the device, how much it costs to build a prototype, and how long it takes. Three alternative designs were outlined, and it is believed that we picked the best one to develop further.
>
> We hope you believe the design is effective, as this product may bring more success to our company. The product could be popular, increasing sales and helping our company to be better known in the market. Overall, it could bring benefits for all of us.
>
> If you would like more information, then please contact the authors for discussion. We can provide a presentation to show our ideas to you in person. We hope to arrange an appointment to meet with you soon.
>
> Thank you for reading our proposal. We hope you will be satisfied with our idea, which can lead all of us into a bright future.
>
> *(166 words)*

This conclusion is unsatisfactory, for several reasons. Which of the following problems exist in the conclusion? Answer ‘yes’ or ‘no’ for each one.

1. Benefits to the company are not clear enough.
2. There is too much repetition of material that should have appeared in earlier sections.
3. There is no clear call to action.
4. The language style is too formal.
5. There are not enough connectives, leading to ineffective flow within paragraphs.
6. Sentences are too short and do not show rich grammatical structure.
7. It does not show enough confidence in the proposed product.
8. There is no statement of what happens next, if the proposal is accepted.
9. The ending is unsatisfying.
10. The word count is insufficient.

## EXERCISE 4

Read the sample conclusion below, and answer the questions that follow.

This conclusion would be suitable for an iPhone app called GranEase, which is designed to make it easier for seniors to perform basic functions on their iPhone. It simplifies the user interface, and provides shortcuts with large symbols for a selection of common functions.

> In this proposal, we have shown that our proposed app 'GranEase' can be developed within 9 months at a cost of HKD1.4M. Within this timescale and cost, we can develop the app, perform user tests and enhancements, and launch to the App Store. We will also provide data to the Marketing Department to enable them to develop web pages for GranEase, user guidance via Siri, and training for customer service personnel.
>
> GranEase will be valuable to help seniors perform basic functions on an iPhone. Not only will GranEase encourage seniors who already own an iPhone to make better use of it, increasing user satisfaction and the likelihood of buying another iPhone or iPad, it will also make the iPhone a more attractive choice for non-users, and provide a competitive advantage over Android devices. Thus, Apple will increase market share and retention of existing customers.
>
> Should the management team decide to proceed, we request authorisation of the HKD1.4M budget. We also ask permission for the authors of this proposal, Chan Pak Hin and Tsui Man Ho, to work full time on this project for the next 9 months. Finally, we request that Management instruct the Marketing Department to allocate a team member to work with us on preparing the marketing and user guidance materials.
>
> On receiving Management's go-ahead, we will immediately arrange to recruit the two extra team members needed. We will also develop a detailed project plan and app design, which will be submitted within the first 4 weeks. This will ensure we can achieve the project's timeline.
>
> GranEase will be a valuable addition to Apple's software offerings. It will strengthen our position in the market, broaden the appeal of the iPhone range, and improve customer retention. We look forward to the opportunity to add this quality new product to the Apple portfolio.
>
> *(303 words)*

### *Questions*

1. What is the main purpose of each paragraph?
2. The conclusion aims to convey a feeling of confidence in the proposal and the product, GranEase. How does it do this?
3. Underline the places that repeat information probably already given earlier in the proposal (e.g. the costing and development time). What percentage of the total word count did you underline?
4. What actions do the authors ask for?
5. Do you think the ending is satisfying? Why, or why not?

## EXERCISE 5 CONCLUSION LEGO

Suppose you are writing a proposal for a product called “I’ve got your back”.* This is a trendy, urban-style backpack with novel features including:

1. Fully waterproof
2. Contains a built-in umbrella
3. Has a special pocket in the front for your money and phone, with a fingerprint-activated lock
4. Has a Bluetooth tracker, which connects to your smartwatch. Your watch will alarm if your bag is out of range (e.g. forgotten or stolen).

* “I’ve got your back” is an idiom meaning “I’m protecting you” or “I will help you if you get into trouble.”

### *Part 1*

The sentence pool shown below can be used to form a conclusion for your proposal. The teacher will provide the sentences on cards. Work in a group of 3-4 students to select suitable sentences to construct your conclusion. You do not need to use all the cards.

### *Part 2*

Still working in your group, make your chosen sentences into a well-formed conclusion by:

- Arranging the sentences into paragraphs
- Adding connectives
- Making any other adjustments needed.

You can download the sentences from “Exercise 3F.5 – Conclusion sentences.docx” in the course materials so that you do not need to retype them on your laptop or iPad.

### *Sentence pool*

1. We request support from the sales and marketing departments.
2. We will assemble our development team.
3. The backpack fits the company’s philosophy of useful, trendy and technically advanced products.
4. We were given a target retail price of HKD1,350/piece.
5. The backpack’s features will be useful for urban, tech-savvy professionals.
6. We request management’s permission to proceed with development.
7. We can complete development in time for this year’s Christmas peak retail season.
8. This product will establish our company on the road to future success.
9. The backpack complements the company’s existing range of lifestyle products.
10. We will produce a first rough prototype within 3 months.
11. The cost of manufacturing the bag is low enough to allow a good profit on sales.

12. Our team will include specialists in textiles, mechanical engineering, electronic engineering and ergonomics.

13. Selling this backpack will be good for our company’s brand image.

14. We will prepare our detailed development plan.

15. We request the management to authorize the budget.

16. We described our idea for an innovative backpack named “I’ve got your back”.

17. The cost to manufacture the backpack will be HKD450/piece.

18. We are keen to bring this product to realization.

19. This is an exciting, high quality and innovative product.

20. We can do all the development in-house, using existing staff and equipment.

21. We can develop the backpack within a budget of HKD850K.

22. The backpack has contemporary styling and a range of useful features.

23. This product will bring publicity and commercial success to our company.

24. We request an appointment to present our proposal to the management in person.

# MODULE 3G
# WRITING AN EXECUTIVE SUMMARY

## Learning objectives:

- Understand the purpose of the executive summary in a proposal
- Know what to include in the executive summary
- Understand that the executive summary is standalone
- Know how to set a positive, confident tone

## 3G.1 PURPOSE OF THE EXECUTIVE SUMMARY

**Table 3G.1. Main features of the Executive Summary**

| | Feature | Details |
|---|---|---|
| 1 | What is an Executive Summary? | A short overview of the whole proposal. |
| 2 | What is its main purpose? | To allow the reader to get a quick impression of the main subject and content of the proposal, to help them decide whether to read the rest of it. |
| 3 | Who is the intended reader? | A decision maker (such as a manager) who has not read the rest of the proposal yet. |
| 4 | How long should it be? | Usually 200-250 words, or 10% of the main document. Keep it concise and tightly worded. |
| 5 | What are some important features of an executive summary? | • Self-contained and standalone (not referring to the main text)<br>• No references<br>• Usually no tables, figures or diagrams |
| 6 | Should the executive summary be written in a persuasive style? | Like the rest of the proposal, your executive summary should be persuasive. This is best achieved by showing that:<br>• Your proposal is detailed enough;<br>• You have considered all relevant issues;<br>• You have confidence in your own proposal.<br>• It is not appropriate to write in a pushy, salesman-like style. |

| | | |
|---|---|---|
| 7 | What is the difference between an executive summary and an abstract? | The term 'abstract' is used in academic writing, while 'executive summary' is used in industrial and business writing. The two terms mean essentially the same.<br>• Informative writing (e.g. journalism) uses the term 'précis' (pronounced: pray-SEE), which is similar but shorter (50-100 words).<br>• A 'digest' (pronounced: DIE-jest) is also a shortened version of a long document, which could be any length up to around 500 words. |

## 3G.2 WHAT SHOULD BE INCLUDED IN THE EXECUTIVE SUMMARY?

You should include, as briefly as possible, all the points needed for the reader to understand:

1. The background situation—why your proposed product is needed
2. What your proposed product is, including a few key features
3. Your product's benefits to the user
4. You have considered alternative products or solutions (but you do not need to explain what the alternatives are)
5. Your proposal is feasible
6. Your proposal brings benefits to the organization.

This is a lot of material to pack into 200-250 words, so you need to keep it very brief and focused.

### The Executive Summary should be standalone

Try not to refer to the main text, or to references, figures, appendices etc. If the reader wants more details, they can look it up in the main part of the document.

Here are some examples:

| | |
|---|---|
| Not standalone | In section 4, we explain 3 different design options, and indicate which design we prefer. |
| Standalone | Three design options were considered, with one option preferred based on cost and feasibility. |
| Not standalone | Section 3 contains screenshots showing how we expect our app to look. |
| Standalone | We have developed screenshots to demonstrate the expected look of our app. |

## 3G.3 IMPORTANT POINTS TO CONSIDER

### *(A) Show that your proposal meets the basic requirements*

If you were given some criteria such as target users, budget limit, or compatibility with other products: make sure you show these criteria are met. Otherwise, your proposal may be discarded immediately.

### *(B) Avoid low-level design details that do not affect the reader's yes/no decision*

Provide only the details necessary to show that the product is functional and effective.

### *(C) If comparing your product with others, keep it brief*

You can briefly mention: "Our product has significant advantages over existing products, such as longer battery life and better waterproofing." Do not list the competing products or explain the differences in detail.

### *(D) Show confidence in your proposal*

This is best done by using positive, confident phrases such as "Our product will…" or "We expect to…". You do not need to appeal directly to the reader, so avoid phrases such as "We hope you will accept our proposal."

#### EXERCISE 1

Suppose your proposal is to develop "I've got your back", the smart backpack idea described in Section 6 (Conclusion). Which of these design details would be appropriate to include in the executive summary?

1. The bag is made of cut-resistant fabric.
2. The built-in umbrella is 70cm diameter.
3. The bag will be available in four colours.
4. The styling of the bag will match the company's existing product line.
5. The Bluetooth anti-theft function will use the Bluetooth 4.0 Low Energy standard.
6. The size and weight of the bag is similar to a typical 30L backpack.

#### EXERCISE 2

Revise each of the following sentences to make it more confident-sounding. Where appropriate, try to show evidence for each statement. The first one is done as an example.

1. We hope to develop our prototype within 6 months. → **We have prepared a project timeline showing that our prototype can be developed within 6 months.**
2. We believe our product will bring significant benefits to the user.
3. Hopefully, the product will be profitable.
4. We think our product will not overload the company servers.

## 3G.4 SAMPLE EXECUTIVE SUMMARY

Here is a suitable executive summary for the “I’ve got your back” proposal.

> Modern urban professionals work from multiple locations, and need a safe, secure and elegant way to carry equipment such as laptops, documents and an umbrella. We propose to develop a new backpack named “I’ve got your back”, including novel features such as a built-in umbrella, waterproofing, a wallet pocket in the front with a fingerprint-operated lock, and an anti-theft Bluetooth tracker. These features were selected based on a survey of 85 professionals working in Hong Kong financial institutions. A backpack configuration was chosen above other options (such as shoulder bag) based on the survey results.
>
> The backpack will be constructed in anti-cut polypropylene fabric. The size, shape and weight will be typical of other 30 litre backpacks on the market. Styling will be modern, urban and minimalistic, in line with the company’s existing products. Our initial costing shows the bag can be manufactured for HKD450/piece, allowing for a reasonable profit margin against the target sales price of HKD1,350. The prototype will be ready within 6 months, and production can be in full operation in time for the peak Christmas sales season. Our multidisciplinary project team is ready to start development as soon as authorization is given.
>
> *(196 words)*

### EXERCISE 3

Read through the sample proposal for “I’ve got your back”. Highlight the phrases used to achieve each of the 6 objectives listed in section 3G.2 (“What should be included in the executive summary”).

### EXERCISE 4

Kickstarter is a website that helps entrepreneurs to crowdfund their ideas for development. Go to www.kickstarter.com and choose any one product idea shown there. Read the materials provided in the product’s article and accompanying website. In no more than 250 words, write an executive summary covering the main points in the information you found.

# MODULE 4
# PERSUASIVE PRESENTATIONS

*The learning objective of this module is to enable students to prepare and give persuasive oral presentations in a technical context.*

# MODULE 4
# PERSUASIVE PRESENTATIONS

## Learning objectives

Understand and develop skills needed to prepare and deliver effective persuasive presentations

## References


Borowick, J. N. (2000). *Technical communication and its applications* (2nd ed.). Prentice Hall.

Graves, H. & Graves, R. (2007). *A strategic guide to technical communication*. Broadview Press.

Gurak, L. J. (2000). *Oral presentations for Technical Communication*. Allyn and Bacon.

Gurak, L. J. & Lannon, J. M. (2007). *A concise guide to technical communication* (3rd ed.). Pearson/Longman.


### WARM-UP QUESTIONS

What does it mean to be persuasive? What characteristics does a persuasive person have?

## 4.1 PERSUASIVE PRESENTATIONS

A persuasive presentation aims to influence and convince the audience to adopt a particular viewpoint, take a specific action or change their attitudes or behavior. The primary objective of a persuasive presentation is to sway the audience's opinion, generate support or inspire action by presenting compelling arguments, evidence, and appeals to emotion. It often involves effective storytelling, logical reasoning and the use of rhetorical techniques to persuade audience to align with the presenter's perspective or desired outcome.

### EXERCISE 1 SELLING YOUR IDEA

Imagine that your neighbour is someone who can fund your project. In three minutes, persuade your neighbour that your group project is a worthwhile investment.

***Reflection:***

Did you or your neighbour find the mini-speech persuasive? Why or why not?

How can the speech be improved?

## 4.2 EVALUATING PERSUASIVE PRESENTATIONS/SPEECHES

Discuss and evaluate some sample persuasive presentations/speeches by paying attention to their content, language, organisation and delivery. How do these speakers make their talk persuasive? (All the clips are available on TED and YouTube.)

| Clip | Is it persuasive? Why or why not? | What you like about the presentation/speech/speaker | Organisational pattern | Other remarks |
|---|---|---|---|---|
| 1. My simple invention, designed to keep my grandfather safe | | | | |
| 2. How we built Watch Duty, the lifesaving wildfire alert app | | | | |
| 3. Amos Winter: The cheap all-terrain wheelchair | | | | |
| 4. *(A presentation of your/your instructor's choice)* | | | | |

**EXERCISE 2 TRY AGAIN!**

Now, re-try Exercise 4.1 and apply the strategies/organisational patterns you learnt in 4.2 to your speech.

## 4.3 MODES OF PERSUASION

How can we make our presentations more persuasive? Watch the video *An Introduction to Ethos, Logos and Pathos* (Link: https://youtu.be/9L_G82HH9Tg) and see how they can be applied in your presentations.

| Mode | Appeal to… | Examples/Points to note |
|---|---|---|
| 1. Ethos | | |
| 2. Logos | | |
| 3. Pathos | | |

***Discussion:***

Which of the above principles can your team apply to your presentation? How?

## 4.4 ORGANISATIONAL PATTERNS FOR PERSUASION

Ideas can be organised in certain ways to achieve persuasion. You will need to apply appropriate organisational patterns to suit your context, needs and purposes. Below are two organisational patterns commonly found in technical presentations.

1. Problem-solution pattern

1) B_____ and c_____
2) S_____ of the problem
3) E_____ on people/society/users
4) Solutions
5) B_____ from the solutions/recommended course of a_____

Can this pattern be applied to your presentation? How?

2. Comparative advantages pattern

1) Brief mentioning of the problem
2) Concentration on a_____ of the p_____ plan over the c_____ plan
3) Illustrate how the c_____ plan is much i_____ to your more desirable plan with reasons
4) Highlight the b_____

Can this pattern be applied to your presentation? How?

## 4.5 PLANNING YOUR PRESENTATION

Make use of the brief outline below to plan your presentation. Anticipate potential challenges and discuss them with your instructor.

### Introduction

- Introduce yourself and your team members.
- Tell the audience why your product/project is important by
    - presenting facts, figures, and expert opinions;
    - inviting the audience to participate (where appropriate).
- Give a brief outline of the topics that your group is going to cover (Preview).

| Your plan: |
| --- |
| |

### Body

- Elaborate on the main points by adapting the information to your audiences' needs (e.g. comparing and contrasting information).
- Anticipate what the audience is interested in. Highlight the design and features, and state the relevant benefits. You may also compare your product with other similar products in the market to emphasise the benefits/uniqueness of your design.
- Explain the product design, features (e.g. constructional and operational characteristics) and benefits. Convince the audience that the package introduced exactly meets the needs of the target situation/users.
- Pay attention to the overall organisation and transitions.

| Your plan: |
| --- |
| |

**Conclusion**

- Inform the audience that your presentation is about to end.
- Summarise and highlight the main ideas.
- End in a special and meaningful way.
- Signal that you are about to start the Q and A session.

| Your plan: |
| --- |
| |

**Q & A session**

- What questions do you expect?

| Your thoughts: |
| --- |
| |

## 4.6 MORE ONLINE LEARNING RESOURCES

Below are some relevant learning resources that you may be interested in.

| On… | Title | Link |
|---|---|---|
| 1. Introducing team members | Presentation Skills - How to Introduce your Team | http://www.youtube.com/watch?v=9_UGQYYSXQY |
| 2. Introducing the next speaker | How to Introduce the Next Speaker in a Group Presentation | http://www.youtube.com/watch?v=f6Xa1fq-oPo |
| 3. Describing a product | University of Minnesota Department of Electrical and Computer Engineering Senior Design Show | http://www.youtube.com/watch?v=5HDH3tumv68 |
| 4. Managing a Q & A session | How To Answer Questions On Your Presentation - Presentation Skills - Public Speaking | http://www.youtube.com/watch?v=Hgk215R2zkc |
| 5. The importance of vocal variety | The Importance of Vocal Variety in Presentations | https://www.youtube.com/watch?v=hdBNUDIOIP8 |
| 6. The importance of body language | The Importance of Body Language in Presentations | https://www.youtube.com/watch?v=IqqiDw58NSE |